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Contractors and Engineers Monthly

Vol. 46, No. 8 AUGUST, 1949 $3 a Year, 50 Cents a Copy

Covering the Field

● Bridge Construction

Wooden barges float deck forms from span to span during construction of a 3,639-foot-long bridge to Pensacola Beach. Turn to page 2 for pictures and text.

Wellpoints dewater quicksand before pier construction on a Texas bridge can proceed. See page 59.

● Buildings—for Work, for Play

A 36-story office building is rising rapidly in midtown Manhattan at 100 Park Avenue. Construction story on page 5.

A concrete resort pavilion has been built at Myrtle Beach, S. C., to replace a wooden one razed by fire. See page 29.

● Snappy Road-Mix Job

Neatness, dispatch, and economy marked the road-mix maintenance job covered on page 14. A single machine mixed and laid one course of stone and bitumen 10 feet wide over old concrete.

● Six Miles of Sewer

A pipe-line specialist lays 6½ miles of 36 and 54-inch reinforced-concrete relief sewer through residential Los Angeles. A severe back-pressure problem is no obstacle. Story on page 17.

● WASHO Meeting

A wide-open discussion of current road problems is reported on page 24, in notes taken at the 28th annual meeting of the Western Association of State Highway Officials.

● Concrete Paving, Southern Style

The Magnolia State has 9 more miles of reinforced-concrete pavement in its highway system, thanks to a 1949 contract described on page 35.

● Municipal Airport Expands

Grading and production of sub-base material for a 6,000-foot runway are treated on page 43. The job marks another forward step in the modernization and expansion of the Phoenix, Ariz., airport.

● Earth Dam Under Way

An earth dam is under way near West Peterborough, N. H., to control floods on the Merrimack River. Page 52 tells of general excavation at the site and construction of the concrete outlet conduit.

● Dredging Channel

On a harbor-improvement contract at New Haven, Conn., 5,200,000 cubic yards of material will be dredged from the ship-channel entrance and pumped on shore to fill in low lands. See page 69.

● Road Maintenance Equipment

A highway maintenance industry of $1,000,000,000 deserves new equipment tailored for more effective use, the article on page 80 contends. It points to many places in maintenance work where there is still room for mechanization.

● Pumping Plant

A hole in the ground bigger than Boulder Dam was excavated for a plant which will pump irrigation water to the San Joaquin Valley in California. Forms were used three times for tricky transitional draft tubes. See page 85.

(You will find "In This Issue" on page 4)

Bureau of Reclamation Photo

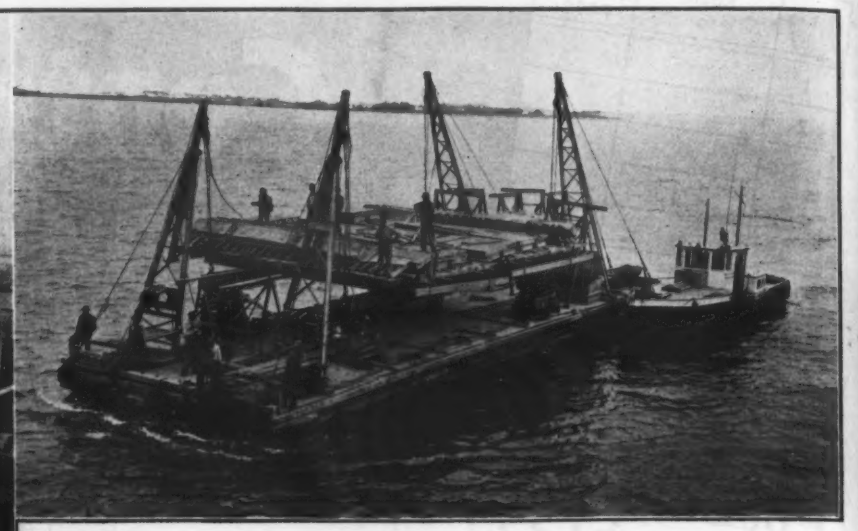
PUMPING-PLANT EXCAVATION. A Euclid loader, pulled by a D-8 Caterpillar, loads dirt out of the topmost part of the Tracy Pumping Plant excavation near Tracy, Calif. The SUMER Co. of Oakland is the joint-venture firm handling the $5,868,695 project for the Sacramento Regional Office of the Bureau of Reclamation. See page 85.

C. & E. M. Photo

CONCRETE POUR FOR BRIDGE. On the Canadian River Bridge job near Borger, Texas, a bucket of concrete is dumped inside a wooden curb form. A serious unwatering problem, which called for wellpoints, marked the $652,969 project reported on page 59. John F. Buckner & Sons was the contractor.

C. & E. M. Photo

ARCH ROOF FOR NEW PAVILION. Visitors to Myrtle Beach, S. C., will find that something new has been added to the ocean front—this pavilion built by Moore Construction Co. The roof, shown here under construction, is supported by steel trusses which span the width of the building. The story starts on page 29.



A barge (at right, above) floats deck forms to a span of the Pensacola Beach Bridge which Johnson, Drake & Piper recently completed to replace a timber bridge across Santa Rosa Sound to Santa Rosa Island on the Gulf of Mexico. Above, Beebe hoists at corner A-frames on the barge raise the form onto the concrete bents of the bridge.

New Bridge Is Built To Pensacola Beach

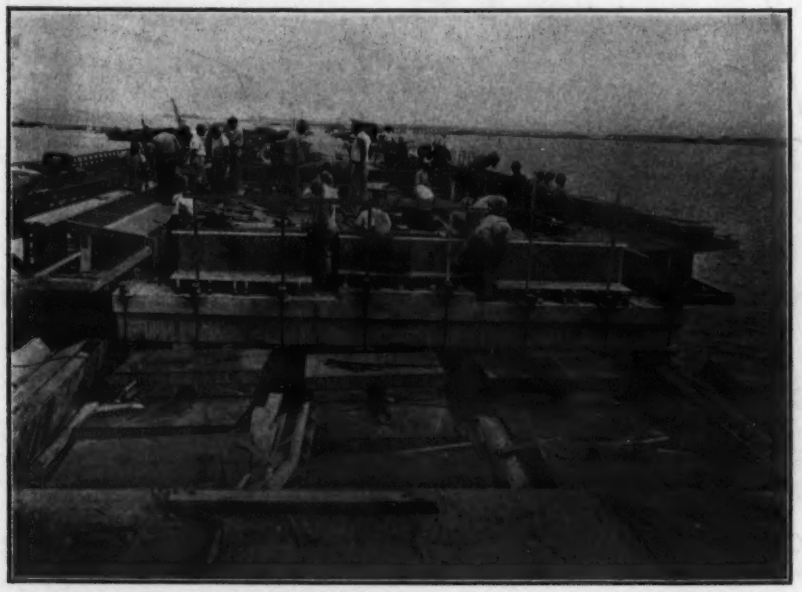
Replaces Timber Structure To Resort Area; 3,639-Foot Span Is Concrete Trestle With Bascule Over Channel

✦ JOHNSON, Drake & Piper, Inc., of Minneapolis and New York, which built the original timber bridge to Pensacola Beach in 1931, has replaced it with a modern concrete and steel structure, 3,639 feet long. Construction was completed in July, in time to serve this northwestern Florida summer resort area. Known as the Pensacola Beach Bridge, the new structure crosses Santa Rosa Sound to Santa Rosa Island on the Gulf of Mexico. From the northern end it connects to Coastal Highway U. S. 98 just across the bay from Pensacola in Escambia County. Johnson, Drake & Piper, Inc., also built the scenic 3-mile-long concrete bridge that spans Pensacola Bay.

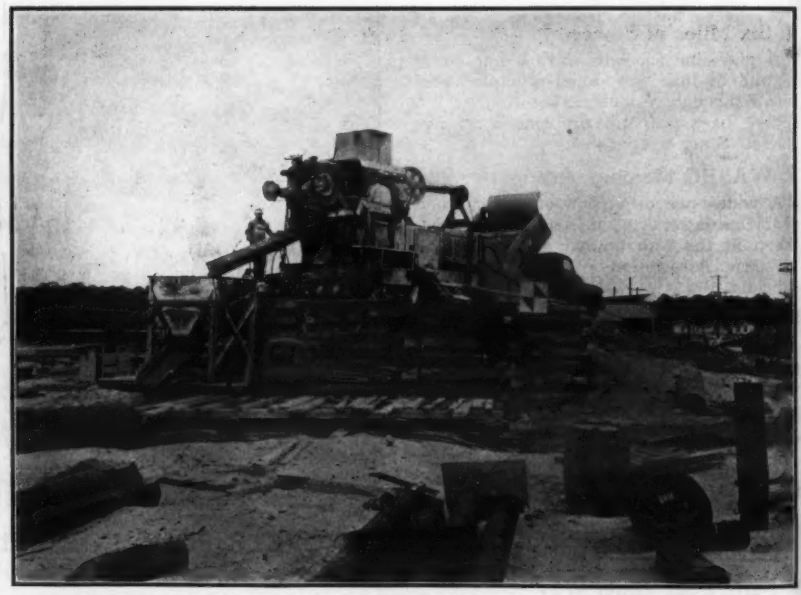
C. & E. M. and Johnson, Drake & Piper Photos

The construction was performed for the Santa Rosa Island Authority, an agency of Escambia County, as part of the general development of Santa Rosa Island. Preliminary test piles were first driven in June, 1948, and from then on work on the long bridge was advanced steadily until its completion at the scheduled time. Designed for H 20-44 loading, the bridge was built according

(Continued on next page)

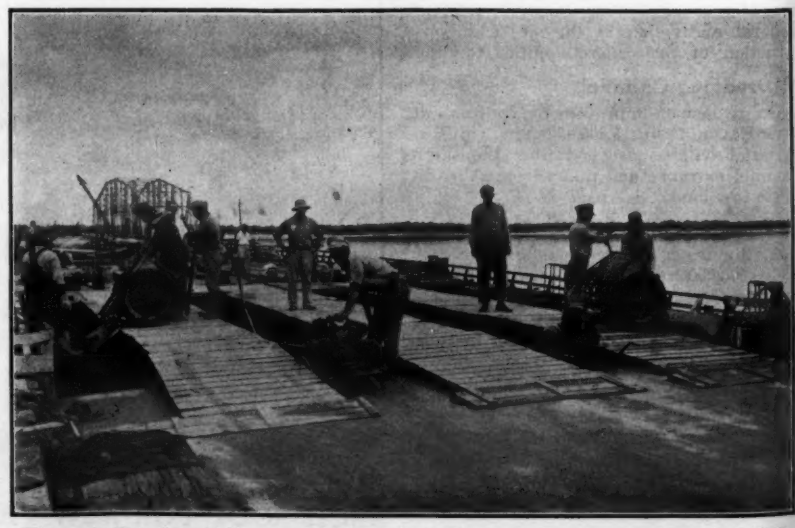


In this view from the top of the bridge, notice the hangers, fastened to the pile cap, which will secure the form in place once it is raised to the proper level.



A Gar-Bro 2-yard floor hopper mounted on a truck receives concrete for the pour from this stripped-down paver on timber cribbing, at the north end of the bridge.

Once it reaches a portion of the deck already poured, the floor hopper discharges concrete into CMC Dumpover carts. About eight of these were employed on a pour.



The carts then deposit the concrete in the deck forms. In the foreground are two Mall vibrators consolidating the concrete as it is placed within the beam forms.

to Florida State Road Department specifications. Total project length with approaches is slightly over 2 miles, and will cost approximately $1,500,000 on a low-bid award basis.

Over Intracoastal Waterway

The original timber trestle was 3,700 feet long, and was built in the short period of only ten weeks. In the beginning it had 4-pile bents, but during its 18-year life additional piles were added on two occasions, while caps and portions of the deck were also replaced. It had a 22-foot roadway and a 14-foot vertical clearance above mean low water. A steel truss draw span on a circular pier swung open for navigation along the Intracoastal Waterway through the protected waters of Santa Rosa Sound.

The new bridge has a 28-foot roadway, with a vertical clearance of 25 feet, and a 207-foot double-leaf bascule over the channel. This bascule has a 139-foot horizontal clearance, face to face of piers, the widest on the Intracoastal Waterway. Effective clearance between fender piles is 125 feet. The two bridges have north-south axes, and were only 48 feet apart on centers with a scant 18-feet separating the near rails. Consequently the channel was moved 500 feet north of the draw span in order to maintain navigation over the waterway during the construction. Four of the new concrete bents were left out in the section across from the draw span until the bascule was completed. As the Sound is about 20 feet deep for the full length of the bridge, except near the shore, the shifting of the channel required no dredging.

While the steel bascule span is supported on concrete piers, the remainder of the new bridge consists of 4-pile concrete bents with 33-foot spans of reinforced-concrete deck-girder construction. The bridge contains 104 such spans, of which 50 spans are north of the bascule and the remaining 54 spans south of the lift. The new bridge is west of the original timber structure.

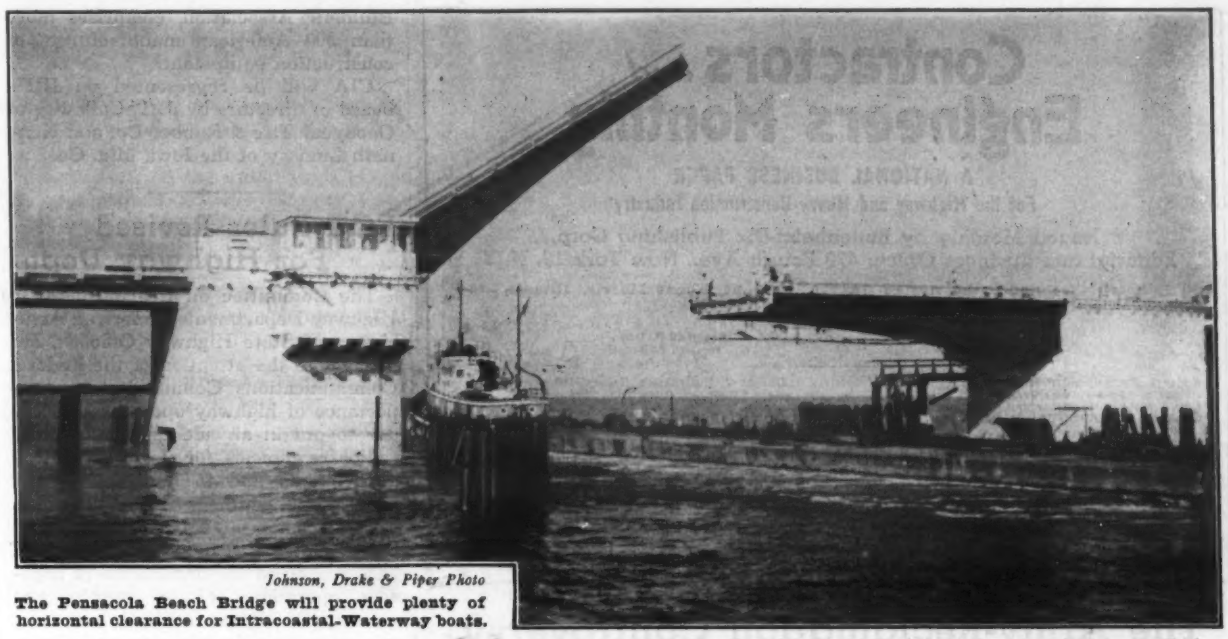
On Concrete Piles

All the reinforced-concrete piles, of which there are 438 in the bridge, are 18 inches square and from 40 to 70 feet long. The two inner piles in the 4-pile bents are plumb, while the outer two are battered 1½ inches to the foot. Each half of the bridge has two tower bents which contain 7 piles; these are all battered 2 inches to the foot. Each abutment has 9 piles, which are likewise battered 2 inches to the foot. Casting of the piles was done in Smith's shipyard, along a bayou in West Pensacola, employing Lehigh high-early cement. The piles were loaded onto barges and towed an average distance of 9 miles to the bridge site.

Casting and driving of the piles were done by Powell Brothers of Fort Lauderdale, Fla., under a subcontract, at the rate of 8 to 10 piles driven a day. They were driven from a floating rig by a McKiernan-Terry S-5 hammer to a 40-ton bearing in the sandy bottom of the Sound. Work started on the north end of the bridge and continued until the existing channel was reached, when driving was started at the south end and was completed with the exception of the bents left out for the operation of the swing span.

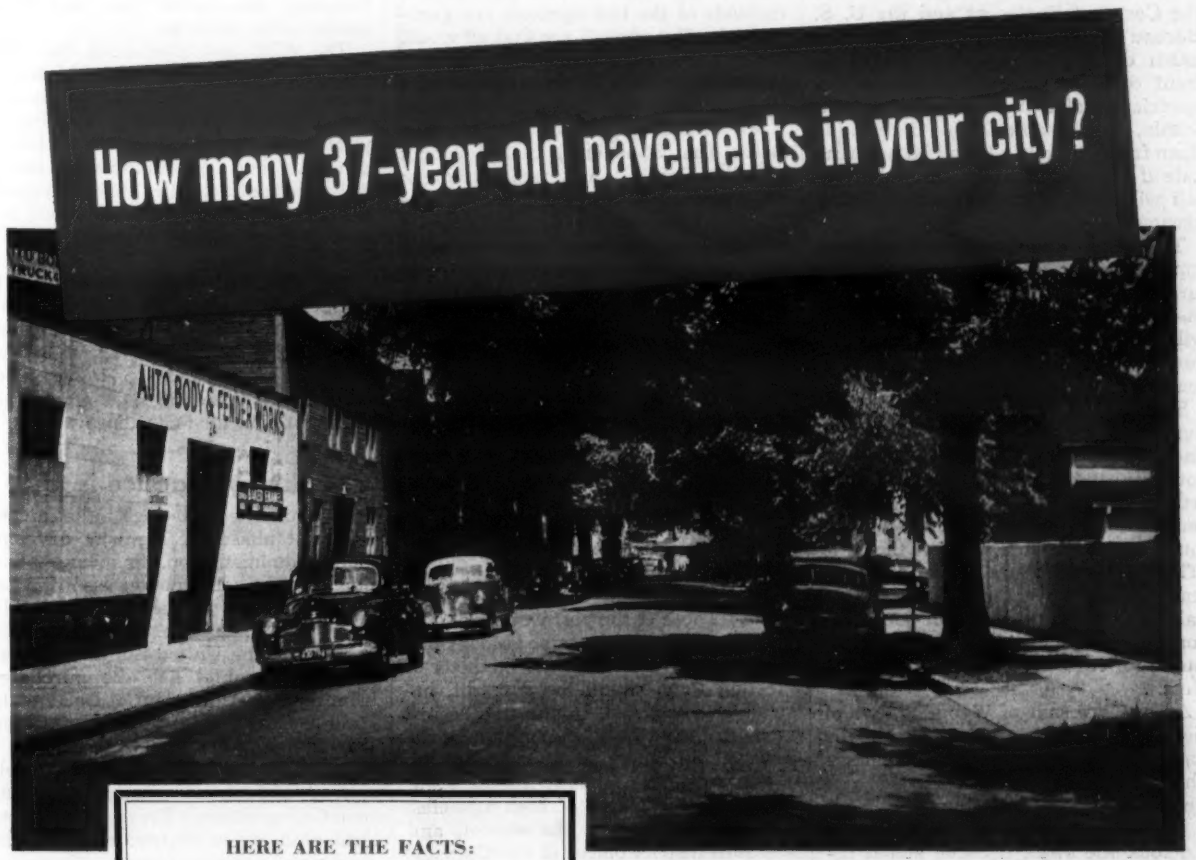
An unusual-looking template was used in driving the piles. It consisted of a welded-steel framework shaped in the form of a T. The horizontal part had a double deck 10 feet apart on which any batter was easily set, thus eliminating the need for leads. The long vertical section was laid out down the center of two bents already driven, being bolted to the inner plumb piles. The horizontal section thus cantilevered out over the next bent to be driven. With this well engineered device, the pile driving progressed speed-

(*Continued on page 93*)



Johnson, Drake & Piper Photo

The Pensacola Beach Bridge will provide plenty of horizontal clearance for Intracoastal-Waterway boats.



HERE ARE THE FACTS:

This Texaco Asphalt pavement was constructed on Mason Street, Springfield, Mass., in 1912.

The type of construction employed was Texaco Asphalt Macadam, using the penetration method.

Maintenance: The 37-year-old pavement has received a single asphaltic surface-treatment to date. A cut made in the pavement for a new relief sewer in 1934 is not properly chargeable against the pavement's performance.

The pavement is in good condition today, still providing traffic with a smooth, easy-riding surface.

Cities look for two qualities primarily in a pavement—rugged endurance and low upkeep cost. This 37-year-old Springfield, Mass., street offers convincing evidence of how well Texaco Asphalt paving meets both these requirements. More than 1500 cities from the Atlantic Ocean to the Rockies have paved with Texaco during the past 44 years. That, too, is strong proof of the fine performance of Texaco-paved streets.

The type of asphalt paving which Springfield selected for Mason Street was Asphalt Macadam, constructed with Texaco Asphalt by the penetration method. An excellent type of construction for city streets, it also is a good choice for municipal parking areas, as well as for the runways, taxiways, etc. of municipal airports.

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Contractors and Engineers Monthly

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For the Highway and Heavy-Construction Industry

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The Army-Reclamation Controversy

The jurisdictional struggle between the Corps of Engineers and the U. S. Bureau of Reclamation must end. Too much dirty linen is being waved in front of John Q. Public. Unless the agencies resolve their differences from within, the public may do it for them from without. It will be unfortunate if that happens, for the public itself will likely suffer more than either agency.

The whole orderly program of flood control, power development, and new farmland is at stake. Let enough of the program get rotten and the public will rise up, just as surely as the rivers flow to the sea, and demand that it all cease.

Some of the Army-Reclamation activity now meets those specifications, or else the *Saturday Evening Post* could not have carried, in its May 14 issue, the article titled "The Battle That Squanders Billions". *Reader's Digest* in June could not have told, under the title "Three Billion Dollars a Year for Federal Waste", how Pine Flat Dam in California was authorized for construction *to both agencies* after each had fought for it for five years before Congress.

An ex-Governor of Wyoming, two of the most reputable publications in the popular field, and countless engineers who work for both agencies recognize the danger signs. It is time the heads of both agencies recognized them too, and took the swift, decisive action indicated. This action should be aimed at correcting the things which make such articles truthful.

We cannot help but feel that the jousting, west of the 100th meridian, is hurting vital work in the high-population centers of the east. It goes without saying that it is also hurting work essential to the development of the west. There are relatively few rotten apples in the barrel of flood-control and irrigation projects, but they have a way of raising a stench unmistakable even to the engineers who administer them.

When this type of job is featured in an article for public consumption, it can easily mean the end of appropriations for that project *and many other legitimate ones.* If an aroused public, staggering under its present load of debt and taxes, demanded of its legislators that these expenditures be stopped, worthwhile projects would suffer with the worthless. American history is replete with examples of public wrath junking whole programs when part of them got bad.

We cannot overemphasize that most of the Army-Reclamation projects are good. Most are properly conceived. Most of them are no more wasteful than an average housewife. Most are handled efficiently. Even in the case of Army and Bureau sub-offices, not all fight each other. Not all the policies and methods of the two agencies are questionable. But enough are that all would suffer if the American public chose to judge all projects by the example of a horrible few.

Mr. Leslie A. Miller's article, "The Battle That Squaders Billions", cannot be taken lightly. As former Governor of Wyoming and a member of the Hoover Commission, he undoubtedly writes from firsthand experience at high level. We know from firsthand experience in the field that some of the information, if not all, is true.

Moreover, the editorial pages of many technical engineering magazines in the field itself have recently carried criticisms of the same general type leveled by Miller. The industry knows about them, now the general public has had it brought to its attention, so isn't it time the agency heads knew?

A good old-fashioned housecleaning of both agencies would seem in order. Dead wood must go. Socialistic ideas should be replaced with sounder concepts. Those of the past would do. The Bureau today has the same responsibilities it had yesterday. Its methods of meeting them should be a credit, instead of a contrast, to the fine record made in the past under men like Davis, Savage, and Young.

It is unfair to the many fine men and women in the offices of both agencies, particularly those in the eastern and southern district offices of the Corps of Engineers, who have always done their best, to allow this sort of thing to continue.

The Chief of Engineers and the Commissioner of Reclamation should take immediate steps to houseclean both agencies, and to force a reorganization in project thinking. Fighting must end. First projects must be built first, without extra frills, and as economically as possible consistent with sound engineering.

The housecleaning should be started and followed through by men with brains and courage, so that if selfish or biased information is offered, it can be evaluated properly and discarded if necessary with the man who gave it.

Unless agency heads begin this reorganization soon, John Q. Public may have to step in. It will be tragic if he does, for he will do a thorough job; perhaps too much so. It will be a shame, because it will hurt the majority of Army-Reclamation projects and their employees who are doing their best for the benefit of all the people.

CIA Affiliates With IRF

The Construction Industries Association has recently affiliated with the International Road Federation. CIA, also affiliated with the American Road Builders' Association, comprises more than 300 American manufacturers of construction equipment.

CIA will be represented on IRF's board of directors by J. T. Callaway of Goodyear Tire & Rubber Co. and Kenneth Lindsay of the Iowa Mfg. Co.

FCC Rules Revised For Highway Depts.

The Committee on Use of Radio in Highway Departments, American Association of State Highway Officials, has brought to the attention of the Federal Communications Commission the importance of highway operations, in order to obtain an adequate number of radio frequencies for use by highway departments and to bring about appropriate amendment of FCC rules.

The results have been obtained in three principal categories. The FCC has recognized the importance of highway operations (state, county and municipal). It has removed them from an emergency classification and placed them in the public-safety radio service category, like police, fire, and forest conservation services.

The FCC has liberalized the rules regarding the permissible highway-department use of radio to include "communications directly relating to public safety and protection of life or property" and "communications essential to official activities directly related to the maintenance, supervision, and operation of public highways". The new rules became effective on July 1.

The FCC has also allocated over 16 frequencies to all highway departments to be shared geographically on a non-interference basis. The AASHO Committee on Use of Radio in Highway Departments is preparing a geographic assignment plan for FCC approval.

Highway Practice in U.S.

An illustrated 230-page bulletin covering all phases of highway development, administration, financing, planning, design, construction, and maintenance, has been published by the Public Roads Administration. Titled "Highway Practice in the United States of America", this booklet may be purchased from the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C., for 45 cents.

Part I discusses the historical development of highway systems and construction practices; Federal, state and local highway administration; and the means and scale of highway financing. Part II covers the development and purposes of highway planning and the constitution and planning of road systems. Part III deals with the location of highways, with emphasis on aerial surveys; soil surveying and its objectives; and the stabilization of embankments and subgrades. The use and design of each of the many road-surface types is described, and sections on the structural design of both rigid and non-rigid pavements are included.

"It's queer, but sometimes when I'm off the job I get a feeling of inferiority."

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Part IV concerns the methods employed for constructing each type of road surface, and includes a discussion of job management, efficiency of operation, and field and laboratory control of construction materials and processes. The organization of maintenance equipment, its types and uses, and the nature of maintenance work for each road-surface type are also covered.

Steel Backlog Heavy Notes AISC Conference

Engineers from the United States and Canada attending the annual engineering conference of the American Institute of Steel Construction were informed that the heavy backlog in the structural-steel-fabricating industry is absorbing much of the slack in declining business. Present at the meeting were chief engineers from 60 fabricating companies and the Institute's staff of 15 district engineers.

L. Abbett Post, Executive Vice President of the Institute, summed up reports of district engineers by pointing out that the construction of schools, churches, hospitals, and other types of public building is now going ahead at an accelerated rate, while commercial and industrial building in most sections is experiencing some let-up. The slight recession, Post said, has made structural steel generally available for quick delivery. He warned that severe pessimism concerning the possibility of a depression is a strong factor in increasing its likelihood. Indications are, he said, that there is an ample backlog of work to keep things busy for a long time to come.

Wartime Damage to Dams

A study of war damage to European dams shows that design changes are needed to safeguard both new and existing dams. This was the opinion expressed by Joseph D. Lewin, Board of Water Supply civil engineer, who recently addressed the Metropolitan Section of the American Society of Civil Engineers in New York City. Mr. Lewin said that a masonry structure such as Hoover Dam can be rendered a total loss in a 5-minute air raid, while dams of the rock-filled type appear to be the safest. Earth dams, he said, seem to lie between the two with regard to safety.

Masonry dams, to be more resistant to bomb damage, must use larger reinforcing rods to take tensile stresses, he stated. Under the shock of an explosion the smaller rods vibrate much faster than do the larger ones, and thus shatter the concrete more extensively. Damage to an earth or rock-filled dam is localized because it does not tend to fracture, and becomes serious only if the water passing over the dam washes it away. Even in this case, the water is released more slowly and does not cause the same type of flood crest.

Mr. Lewin based his study upon firsthand inspection of dams in Europe last summer and on conversations with designers and engineers who saw the bomb damage when it occurred.

New Skyscraper Rises In Midtown Manhattan

36-Story Office Building Has 94 Column Footings in Solid Rock; Will Have Air Conditioning Year 'Round

By WILLIAM H. QUIRK,
Eastern Editor

✦ EVERYONE has heard the old wheeze concerning the city slicker bragging to his country cousin about the tall buildings he is showing him. Asked for the name of one particularly tall skyscraper, the boasting urbanite, seeking to impress the open-mouthed visitor, casually remarked, "Don't know, it wasn't there when I came by yesterday". Sophisticated New Yorkers have somewhat that same open-mouthed look of bewilderment as they scurry along Park Avenue between East 40th and East 41st Streets in midtown Manhattan, and register a double take at 100 Park Avenue, a 36-story office building that is rising rapidly on the site of the old Murray Hill Hotel.

Although excavation began only December 1, 1948, steel erection got under way on February 15 of this year. A month later when CONTRACTORS AND ENGINEERS MONTHLY visited the job, three big derricks were erecting steel at second-story level on the south side of the site. At the same time the last of the 94 concrete footings for the column foundations were being poured in bedrock. Also along the northerly or East 41st Street side, the final section of brick and masonry foundation wall of the old hotel was being removed. In addition to the excavation, foundation, and steel subcontract work, still another subcontractor was busy assembling a concrete plant at the bottom of the steel framework. The plant is now mixing concrete for the floor arch pours in the building.

Such concerted activity on the part of all contractors is necessary, since the building is scheduled for completion by February, 1950, at a cost of $20,000,000. The George A. Fuller Co. is the general contractor. Ely Jacques Kahn and R. A. Jacobs are the architects. Holding subcontracts on the initial work stages of the project are the Slattery Contracting Co. on the excavation and foundation; Bethlehem Steel Co. for furnishing and erecting the structural steel; Rizzi Construction Co. on the construction of the concrete floor arches.

Replaces Murray Hill Hotel

One of the largest rental office building projects under way in the country, the structure is the first skyscraper to be constructed in the Grand Central Station area of New York City since the early 1930's. It replaces the famous old Murray Hill Hotel, an ornate eight-story Victorian structure of granite, brownstone, and brick that was built in

(Continued on next page)

C. & E. M. Photo
You're looking down into the foundation hole of the new Manhattan skyscraper at 100 Park Avenue, when drilling was in progress. Rock was removed over the entire site to bring the excavation down to 21 feet below street level.

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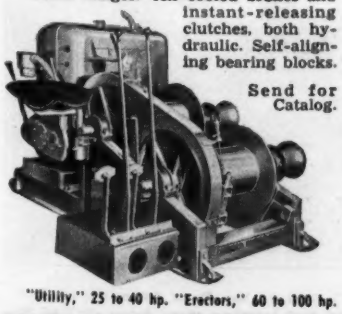

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truck tires

C. & E. M. Photo
On the site of the old Murray Hill Hotel, in New York City, a 36-story office building is taking shape. Even New Yorkers, sophisticated about their canyon city, are agape at the speed with which George A. Fuller Co. is erecting this new skyscraper. Excavation began December 1, 1948, and steel erection got under way March 1, 1949.

New Skyscraper Rises In Midtown Manhattan

(Continued from preceding page)

1884. It was closed officially on April 24, 1947; then the crystal chandeliers, brass cuspidors, and other antique and expensive furnishings were sold at public auction to sentimental one-time guests and dealers. Demolition began later in the year, and the building was razed to ground level.

The excavation work, started on December 1, 1948, by the Slattery Contracting Co. of Woodside, Long Island, consisted of the removal of 5,000 yards of masonry in the old foundation, 10,000 yards of earth, and 15,000 yards of rock. This was over a site that measured 200 feet along the westerly side of Park Avenue between East 40th and East 41st Streets, 240 feet on East 40th Street, and 146 feet on East 41st Street. The jog forming an L, at the rear or west end of the site, has equal sides of 100 feet parallel to Park Avenue.

First in the line of excavation were the 4-foot-thick stone and brick masonry walls of the old hotel, the foundation of which extended to a depth of 12 feet below the street level. Parts of these walls were blasted out, the rest were battered down and dug out with two Lorain shovels—a ¾-yard and a 1-yard model. The old lime-mortar rubble, as well as the rest of the excavation, was spoiled as fill either on Randalls Island in the East River, which was reached via the Triborough Bridge, or at LaGuardia Airport in Queens. From 10 to 20 trucks hauled the material, averaging 7 yards a load. Of the truck fleet, five were Macks, owned by the contractor, while the rest were hired by the hour.

Foundation in Rock

Below the foundation walls of the old hotel, an average 9-foot depth of rock was removed over the entire site, bringing the excavation down to 21 feet below street level for the cellar grade. For the three elevator pits, measuring 20 x 10 feet, the rock was excavated an additional 16 feet below the subgrade. Two sump pits, 15 x 10 feet, were also blasted out to a depth of 10 feet below subgrade. Basement drainage is collected in the sump pits whence it is pumped into the city sewer system.

Drilling equipment for both the blast holes, and for the line drilling around the perimeter of the site and the sides of the pits, included four Worthington wagon drills and several jackhammers with drill attachments. The wagon drills bored holes up to 18 feet deep, while the jackhammers used drill steel up to 16-foot lengths. During the drilling, the stone dust that was created was collected in three Kadco dust-control units that were spotted around the site. This not only was a boon to the drillers, but also improved visibility down in the hole where so much construction activity was going on at the same time.

The average 9-foot depth of rock over the site was blasted out in a single lift, a section at a time. Because of the location in the heart of a great city, the blasts were limited to light charges. Heavy steel woven cable mats were spread out over the area being blasted to contain any flying rock. Air for the drilling equipment was furnished by four compressors—a Jaeger 600-cfm, a Chicago Pneumatic 500-cfm, a Worthington 500-cfm, and an Ingersoll-Rand 500-cfm. As the hole deepened, a timber ramp was constructed from the bottom up to the East 41st Street level. The ramp was 83 feet long on an 11-degree incline which was negotiated by the trucks

(Continued on page 8)

C. & E. M. Photo
The first day C. & E. M. visited the job, a clamshell on a truck crane was loading a truck with the last pieces of the old hotel wall along East 41st Street. And inside the foundation hole, a Jaeger 600-cfm compressor was supplying air to rock drillers (an average 9-foot depth of rock was removed over the entire site).

C. & E. M. Photo
In the hole, looking along the foundation or vault wall on the Park Avenue side. The long 12 x 12's which shored up the soldier beams and lagging were later shifted to brace the foundation-wall concrete until it attained its full strength. Slattery Contracting Co. subcontracted the excavation and foundation part of the job.

Wide World Photos, Inc.
Bethlehem Steel Co. is furnishing and erecting structural steel for 100 Park Avenue. Here two giant derricks double-team to lift a 20-ton steel beam into the framework.

C. & E. M. Photo
At second-story level on the south side of the site, the C. & E. M. photographer catches two steel workers bolting a beam in place while the derrick still supports it.

C. & E. M. Photo
By the last part of June the steel work had reached the tower portion of the building and was approaching completion. Following the steel up floor by floor, Rizzi Construction Co. was pouring the concrete floor arches.

J. P. Lohman Organization Photo
When the $20,000,000 building is completed next February, it will look like this—with a base of polished granite, a Georgia marble front to and including the second-story window sill, and white face brick above that.

New Skyscraper Rises In Midtown Manhattan

(*Continued from preceding page*)

without difficulty. On the excavation a double shift was worked six days a week. Only drilling was done on the late second shift, the shovel work and truck hauling being confined to the day shift. Lighting for the night shift was provided by three 750-watt floodlights and several 200-watt bulbs strung out over the section being drilled.

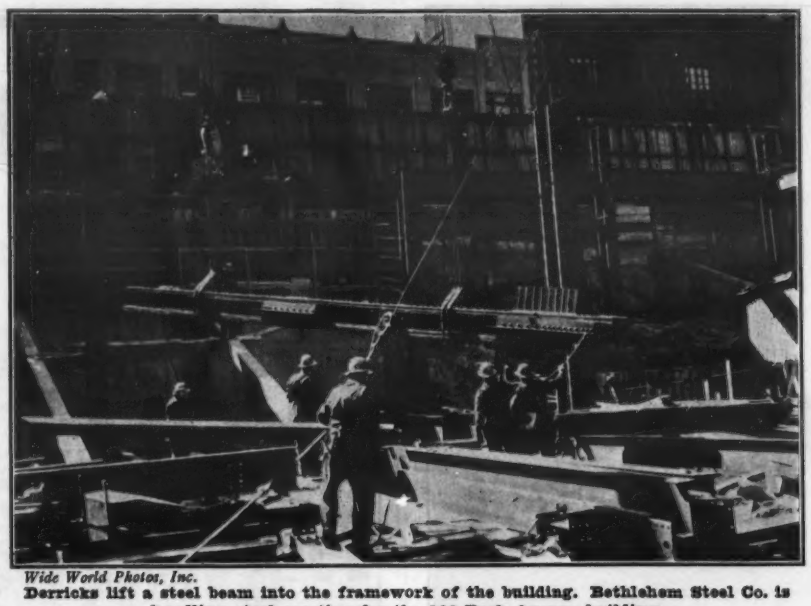
In removing the rock it was estimated that as many as 30,000 vertical holes were drilled in addition to numerous horizontal holes. Line drilling around the lot amounted to 938 linear feet, while around the perimeter of the pits the line drilling totaled 437 linear feet. The daily consumption of dynamite during the blasting period averaged 160 sticks.

Bracing and Shoring

Around the three street sides, as the excavation was in progress, steel 10-inch H 75-pound soldier beams were driven on 8-foot centers. These beams, from 12 to 27 feet long according to the depth at which rock was encountered, were driven by a McKiernan-Terry No. 7 hammer, powered with air supplied by one of the compressors. The hammer was swung from a Lorain Moto-Crane equipped with a 35-foot boom. Between the steel beams horizontal 3 x 10 timber lagging was placed extending down to the rock. A total of 16,200 square feet of lagging or sheeting was required. Steel stringers were laid out on top of the soldier beams to support the high wooden fence enclosing the excavation.

Every other vertical beam or pile was shored up with a 12 x 12 timber 30 feet long that was braced at the bottom of the hole. Steel wales were also installed when required, usually about 4 feet above the bottom of the hole. When the footings were poured for the foundation walls around the sides, they were also shored up and then the wales were removed. After the walls were constructed, the shoring was shifted from the soldier beams to the wall itself until the concrete had attained its full strength. Then the heavy shoring was removed.

The three street sides of the site were thus well protected against movement of the surrounding ground. The tall adjoining building on the East 40th Street side has a deep foundation and required no particular attention. But on the East 41st Street side the adjoining structure is only 3 stories high, 16 feet wide, and not quite 100 feet deep. The street floor is occupied by a bar and grill. Because of its shallow foundation, this building required shoring or underpining. Accordingly, excavation to rock was made beneath the building, and the space was filled with concrete. This was done in alternate 4-foot sections along the long side of the building until the new concrete foundation on solid rock was completed. During all this delicate underpinning beneath the building, and the blasting alongside of it in the hole, not a bottle was broken in the bar and grill.



Wide World Photos, Inc.
Derricks lift a steel beam into the framework of the building. Bethlehem Steel Co. is handling steel erection for the 100 Park Avenue building.

Concrete Wall and Footings

The size of the basement in the new office building is 7,080 square feet greater than the area of the first floor. This was effected by constructing the reinforced-concrete foundation walls of the building at the curb lines in the streets, thus forming vaults that support the sidewalk above. On the cross-town streets the building line is 13 feet back from the curb, while on the Park Avenue side the distance is 20 feet. Footings for the vault or foundation walls are 3½ feet wide x 2 feet high, while the walls are 18 inches thick and extend up to street level.

(*Continued on next page*)

DIG HOLES
SITTING DOWN

The Danuser Digger attachment for all popular makes of tractor—gives automatic one-man operation for digging holes—ideal for Guard Rail Post Setting—augers from 4" to 24" available—write Dept. D.

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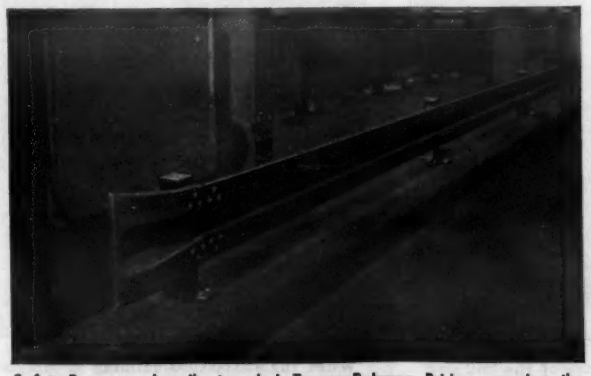
Manufacturers of the famous Danuser All-Purpose Blade

Safety-Beam installation in bridge-approach span at Altamaha River, near Glenville, Ga. Contractor: H. M. Pafford, Jr., Waycross, Ga.

As one bolt fastens Safety-Beam to any post, installation can be handled by unskilled labor.

Safety-Beam Provides Extra Protection at Danger Points

Nearly 700 ft of Safety-Beam, installed along eastbound and westbound lanes, protects motorists at this bridge over Routes 6 and 46, near Totowa, N. J. Guard Rail Erector: Whitmyer Bros., Folsom, N. J.



Safety-Beam on heavily traveled Tacony-Palmyra Bridge, crossing the Delaware River north of Philadelphia, offers protection to both motorists and pedestrians. Installation by Tacony-Palmyra Bridge Co.

At turns, embankments, bridge approaches and other danger points along highways, you'll often find Bethlehem Safety-Beam Guard Rail on the job, providing extra protection for motorists.

Bethlehem Safety-Beam Guard Rail has what it takes to meet the thrusts of runaway vehicles because it is made up of heavy sections of steel plate, bolted together on steel or wood posts to form a continuous, impact-absorbing beam. When a vehicle strikes Safety-Beam, impact is absorbed by several adjacent posts, making it virtually impossible to break through the rail. In most cases, Safety-Beam redirects vehicles parallel to the rail.

Safety-Beam Guard Rail is easily visible at all times. It is easy to install, even by unskilled labor, for the rail fastens to the post with only one bolt. No end anchor rods, special tools, or complicated adjustments are required.

We've an interesting folder which will tell you what you want to know about Safety-Beam. Write to us for a copy. Ask for Folder 545.

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BETHLEHEM STEEL

To support the structural-steel framework of the building, 94 column footings of plain concrete were constructed in sizes ranging from 5 x 5 feet to 10 x 10 feet, and from 1 to 10 feet in depth. All footings are down to a granite rock having a bearing power of 40 tons to the square foot. Either wooden forms or the sides of the holes cut into the rock were used for the concrete pours. The foundation required about 1,000 cubic yards of concrete, and about 100 tons of reinforcing steel, supplied by the Bethlehem Steel Co.

Ready-mix concrete for the foundation was supplied to the job by the Colonial Sand & Stone Co., Inc., from its plant in Manhattan. About 100 cubic yards a day was poured with an average of five truck-mixers. Their arrival at the site was carefully regulated so that not more than one truck-mixer would be delivering concrete at a time. Delivery of all job materials was a problem in the heavy traffic of crowded city streets. Openings were temporarily cut in the wooden fence surrounding the site, and the truck-mixers parked along the curb and chuted the concrete into these windows. The chute emptied into a hopper with elephant-trunk pipe leading down into the hole. On the vault-wall pours the concrete was usually chuted directly into the plywood forms. On foundation footings and other pours away from the perimeter of the site, the concrete was discharged into 1-yard buckets which were handled by either the truck crane or a crawler crane with a 50-foot boom.

As the concrete was placed it was vibrated with Roeth vibrators. New York experienced a mild winter during the opening months of 1949 which permitted the placing of concrete with little danger from freezing. The exposed tops of the column footings were covered with a thick layer of straw as a precaution against the cold. The bottom of the deepest column footing is 20 feet below the finished cellar or basement floor, or 42 feet below street level. The cellar floor is a 6-inch concrete slab on 18 inches of gravel fill. Because of the topography of the ground, the single basement is on several levels. At this point Park Avenue slopes to the north, the top of curb elevations at the northeast and northwest corners being 62.5 and 66.6 respectively, while the southeast and southwest elevations are 71.1 and 74.1 respectively.

By March 1 the general excavation was practically completed, although some rock drilling and blasting continued for a few more weeks. On Sunday, March 13, the work ramp giving access to the hole from East 41st Street was dismantled, and the next day the last fragments of the old hotel foundation wall along the north side of the site were removed. This was done by a clamshell bucket on the truck crane. The little rock that remained to be excavated was loaded by hand into Stuebner ½-yard tip-over buckets. The truck crane hoisted these from the hole and dumped them into a waiting truck. With the ramp removed, access into the hole was made via two stair ladders from the Park Avenue and the East 40th Street sides.

Steel Work

On February 15, strictly according to schedule, Bethlehem Steel Co. began setting billets and grillages. It commenced erecting steel on March 1. Approximately 10,000 tons of steel will go into the building, and the steel work was expected to be substantially completed by July 8. On top of the concrete footings, steel billets weighing 2¼ tons on the average were set to exact grade by means of steel shims. Grillage members were set and grouted into place, and columns began to rise along the south side of the site. The spacing of the 94 columns varied, of course, according to the loads, but 20-foot spacing both ways may be considered average. The heaviest single member in the structure is a 22-ton section of column for the first tier. The first tier of columns extends from the basement to the first floor level; the second tier from the first to the second floor; above that each tier takes in two floors. The first tier of steel comprises 900 tons.

All steel for this job was fabricated at Bethlehem, Pa., and shipped via the Lehigh Valley railroad to the piers at Jersey City, N. J. There it was unloaded onto lighter derricks and towed to the East River dock at East 20th Street, Manhattan. The derricks on the lighters transferred the cargo to the trucks of Bigley Bros., a hauling concern that delivered the steel to the job site. Since no storage space was available at the site, the steel was kept in Jersey City until it was wanted for erection. Three or four trucks sufficed for hauling.

At the start of the job three Bethlehem derricks were set up, and as soon

(*Continued on next page*)

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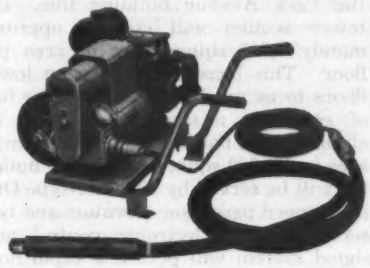

WHY? Because there's no flexible shaft! No engine to move! The Generator is set off the job, out of the way. Only a lightweight cable runs to the vibrator. One man operates it, the On-Off switch is at his fingertip. 9,500 VPM with no power loss insures faster and more uniform concrete placement.

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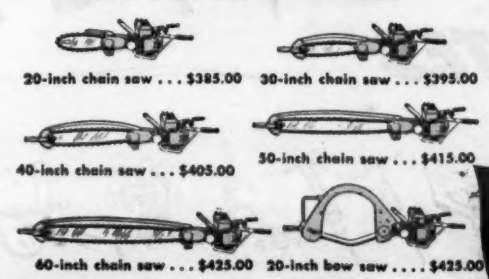

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New Skyscraper Rises In Midtown Manhattan

(*Continued from preceding page*)

as the erection had spread out over the entire job site two more derricks were added. All five derricks have 100-foot masts, 90-foot booms, and are operated by two-drum gasoline-powered hoists, either Clyde or Mundy. They were guyed either to the foundation rock or to the steel already erected. Each of the five derricks here made 8 moves upward, jumping themselves two floors at a time. Three of these derricks made eleven additional moves in erecting the tower portion of the building.

When the trucks delivered the steel to the job site, the derricks swung out into the street, picked up the members, and lowered them down into the hole, or laid them out on the floor. The heavier members were usually handled by two of the derricks working together. After being placed inside the fence, the steel members were sorted, erected, plumbed and aligned, and bolted into place. They were then riveted permanently together with 1-inch rivets. At the start of the job four riveting crews of four men each—heater, catcher, riveter, and bucker-up—were employed. A single Worthington 210-cfm compressor furnished the necessary air for the Ingersoll-Rand and Chicago Pneumatic riveting hammers. Later, when the five derricks were in use, four more riveting crews were added, and another compressor was brought to the job. When the main part of the structure is completed, and only the tower remains to be erected, two of the derricks will be taken off the job and the number of riveting crews will be decreased. The erection schedule for the tower calls for the completion of two tiers or four stories each week. All hoists were re-set on the 14th floor by May 18, 1949.

Concrete Arches

Less than a month after the start of steel erection, the Rizzi Construction Co. of New York City moved in on the job to begin the pouring of the concrete floor arches. A typical arch is a 4-inch slab of reinforced concrete covered with a 2½-inch cinder-concrete fill, on which is placed a 1-inch topping of cement-sand mortar. The work schedule set up for this subcontract called for the completion of the concrete arches by July 31, less than a month after the entire steel framework was expected to be erected. Thus the pouring of the arches followed the steel up floor by floor.

With such an intensive pouring schedule ahead, it was decided to set up a concrete batch plant right on the job instead of using truck-mixed concrete. Accordingly four bays near the southeast corner of the building were turned over to the subcontractor as a site for his plant. A mat of 12 x 12 timbers was spread out over this area at cellar grade, and a Koehring 28-S concrete mixer was set up. Aggregate and bag cement were delivered to the job and stored alongside the mixer. Two floor beams were left out of one 26 x 24-foot bay all the way up in order to provide a shaft for the material hoist serving the floors.

Wooden forms were used for the arch pours. They were hung from the structural-steel framework by No. 8 Bright wire. When the concrete was mixed, it was discharged into a bucket that was lifted on the hoist to the floor under construction. The bucket was then emptied into a hopper which fed the Jackson rubber-tired buggies that were wheeled to the forms. The arches were reinforced with Pittsburgh welded-wire fabric.

Design Features

The 36-story office building will have setbacks at the 9th, 11th, 14th, 15th, 17th, and 21st floors, and a tower rising from the 22nd to the 36th floors. The tower will be rectangular, measuring 131 x 71 feet, and set back 29 feet from the Park Avenue building line. The tower section will contain approximately 7,800 square feet of area per floor. This increases in size on lower floors to as much as 32,000 square feet of space on a single floor, with an abundance of natural light. Total rental area is 660,000 square feet. The building will be served by 18 latest-type Otis high-speed passenger elevators and two service cars. Electronic control and signal system will permit a rapid flow of traffic.

On the outside the skyscraper will have a base of polished granite, with a Georgia marble front to and including the second-story window sill, and white face brick above that. The front entrance on Park Avenue will be 60 feet wide instead of the conventional 20, with the doors leading to the lobby set back 10 feet to form an attractive loggia.

(*Concluded on next page*)

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TIME LOST IS MONEY LOST . . .

and when you're on a tough schedule, a broken track tension bolt can tie you up anywhere from 6 to 8 hours. Don't take a chance with losses like this—keep a QUICK-ON Emergency Cap Tension Bolt on every Cat. Simple installation *right on the job*—gets you going again in 30 minutes. Retails for only $12.50 . . . an insignificant cost when you consider the big saving in *time* and *money*. Order QUICK-ON Emergency Cap Tension Bolts today for all of your D8's . . . see your dealer or write us direct.

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Get *all* the air-power out of every drop of fuel with a Blue Brute 60′ Portable Air Compressor. Strong, light and efficient, it provides constant, dependable, economical air supply through its easy-breathing Worthington Feather* Valves. Other Blue Brute Compressors, from 105′ to 500′.

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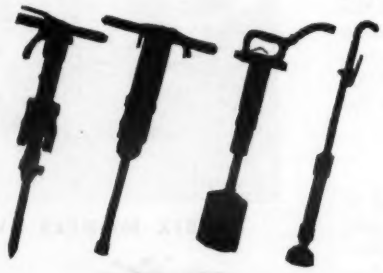
Construction Expenses at Rock Bottom!



Team up these fast, hard-hitting Blue Brute Air Tools with Blue Brute Compressors — and watch your daily expenses go down. Though tough and powerful, they have the lightness and compactness to keep your workers more satisfied—and more productive.

10-3

IF IT'S A CONSTRUCTION JOB, IT'S A BLUE BRUTE JOB

The lobby, 40 feet deep, will be open to street view through a completely glass front and glass doors. Another entrance on East 41st Street will lead into the L-shaped lobby. A system of recessed cove lighting in the ceiling will provide illumination. The lobby will be finished with travertine walls, terrazzo floors, bronze, aluminum, stainless steel, and ornamental plaster.

On the inside the building is suitable to large business organizations desiring to have their headquarters on one or several floors, but it is also designed for elastic subdivision if desired. The double-hung aluminum windows throughout the building are closely spaced for flexibility in arranging office partitions, and to obtain the highest percentage of natural daylight. Hollow metal doors and venetian blinds will be installed throughout. All elevator corridors will have terrazzo floors and marble wainscots. The toilet rooms will have ceramic tile floors, tiled walls to ceilings, and black Carrara and glass stalls.

A trucking entrance into the basement of the building is designed for the East 40th Street side at the back wall. At the rear of the entrance will be a loading platform and a freight elevator. This feature eliminates both pedestrian and vehicular street congestion. The entrance is 25 feet wide. From the basement all shipments will be routed to the service elevators, and quickly delivered to their destination in the building.

Air-Conditioned Throughout

A 100 per cent Carrier air-conditioning system, representing radical improvements in operation, and incorporating features introduced for the first time in a large office building, is being installed as part of the basic construction. The cooling and heating units will be located in the same recessed location under each window. Thus all areas of the building will be conditioned twelve months a year—by cooling and dehumidifying in summer, heating and humidifying in winter, and ventilating at all seasons.

The system features a unique zone arrangement for conditioning independently both inner and outer spaces of each floor. This zone layout not only insures uniform effectiveness of air conditioning, but also adds to the flexibility of control.

The outer zones, or areas adjacent to the windows and extending inward for 15 feet, will be provided with Carrier's new Weathermaster system of peripheral conditioning. This will treat a quantity of outdoor air for ventilating purposes, and distribute it through vertical riser pipes. Paralleling these pipes will be a set of supply and return pipes through which pumps and heat exchangers will circulate cold water in summer and hot water in winter to supply additional cooling, or heating, to these spaces as needed.

Under each window there will be an individual induction unit, concealed within the window sill, which will automatically mix, treat, and redistribute outdoor air and re-circulated air from the room itself in sufficient quantity and proportion to maintain the atmospheric conditions desired by the occupants of that area. This operation will be controllable by an individual valve. Each window will thus be, in effect, a complete module, with its own individual conditioning apparatus. No matter where a tenant may choose to locate dividing partitions for his office layout, each section will be provided with proper ventilation and air-conditioning.

The interior zone system, for spaces more than 15 feet from the outside walls, will draw air from corridors or open spaces, and mix it at the fan room with an equal amount of outdoor air. Properly filtered, cooled or warmed, the mixture will then be distributed by the main fan through ducts to strategically located outlets. A separate small fan room will serve every two or three floors up to the 20th, while the tower floors will contain a single primary fan room with local mixing units on each floor.

Steam Heat

Steam from the mains of the New York Steam Co. will provide heat in winter. In summer the steam will drive the Carrier centrifugal compressors to chill the water that will be pumped to all points where cooling is required. A separate system of water pipes will operate the cooling towers on the roof to condense the refrigerant as well as the steam used in driving the turbines.

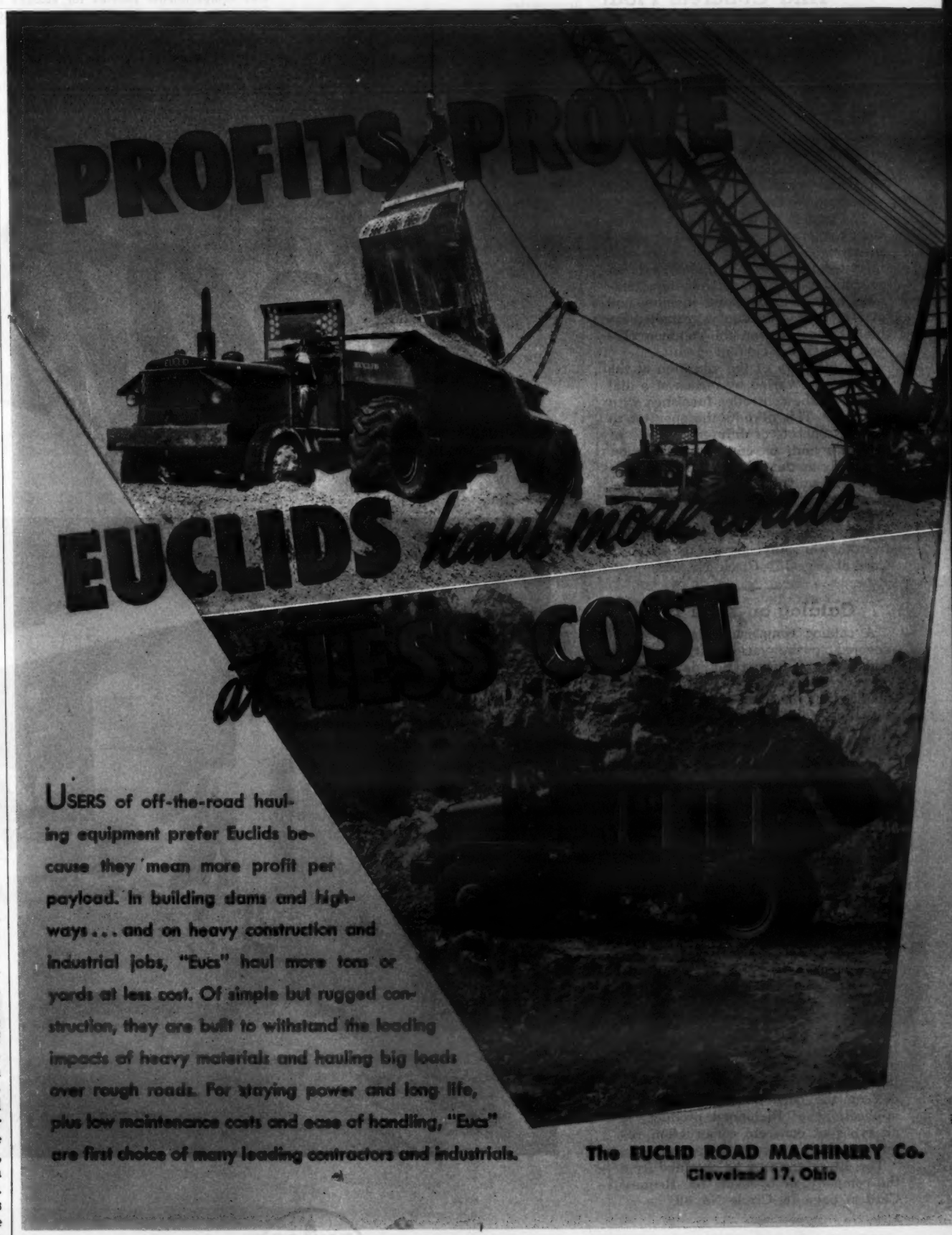
Mechanical exhaust ventilation will be provided for washrooms and other spaces requiring such treatment. Air conditioning of spaces in the four stores to occupy the ground floor, and also the basement, will be provided by the tenants, entirely independent of the main system. This will permit the operation of such spaces during hours when the office areas are unoccupied.

The total amount of outdoor air supplied by the primary fans to the Weathermaster units will exceed 4,000,000 cubic feet every hour. More than 7,000,000 cubic feet of outdoor air will be supplied to the interior zones every hour. Including the re-circulated air, approximately 41,000,000 cubic feet of conditioned air will be circulated throughout the rental spaces of the building every hour. The cooling towers will circulate 360,000 gallons of water every hour through condensers of the refrigerating plant. The maximum steam required for winter heating and ventilation will approximate 1,500 boiler horsepower. About two-thirds as much will be used in the hottest summer weather to operate the refrigerating plant.

Personnel

George A. Fuller Co., builder of the new 36-story office skyscraper known as 100 Park Avenue, is represented on the project by J. F. Murphy, Construction Manager.

Kahn and Jacobs are the architects. Jaros, Baum & Bolles are the consulting engineers on the air-conditioning system. Cushman & Wakefield, Inc., is renting agent for the big office building.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A Syntron vibrating float works on a concrete floor to produce a finish.

New Hand Vibrator And Concrete Float

A new vibrating concrete float has recently been announced by the Syntron Co., 227 Lexington Ave., Homer City, Pa. It is designed in two sizes for semi-finishing concrete and mastic floors, sidewalks, streets, driveways, etc. These vibrating units are said to be particularly useful in floating concrete with an extra-low moisture content, as the vibration eliminates the hard work of hand-floating dry concrete and speeds up the finishing process.

The unit is very simple in construction, being made up of a small 15-pound pulsating electromagnetic vibrator mounted on a 24 x 30-inch float, a three-section 7½-foot tubular handle adjustable for various operators' heights, and a 35-foot three-conductor grounded cable. It operates on the common 110-volt ac lighting current circuit.

The intensity of the vibration at the float can be varied by means of a dial switch in the controller furnished with the unit. This permits the operator to handle concrete of different degrees of moisture and to reduce the vibration gradually as the finish is achieved. The complete unit is shipped in a sturdy, compact carrying case that can be used for transporting or storing the unit.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 65.

Catalog on Form Ties

A catalog comprising eight sections devoted to the various styles, types, and sizes of form-tying devices and other accessories has just been announced by Richmond Screw Anchor Co., Inc., 816 Liberty Ave., Brooklyn 8, N. Y. The purpose of the catalog is to show by charts, pictures, and word descriptions how to select and use the items in the Richmond line.

Each section covers a major product classification. It includes, next to the illustration of the product, construction details, engineering data, and information on how to order. One section is devoted to engineering factors and methods essential to good concrete construction, with charts and data on such subjects as concrete pressure load values, limiting design values for wood forms, sheathing deflection, plywood deflection, stud loads, wale loads, joist loads, post loads, etc.

Among the products covered by the catalog are Snap-Tys, Tyscrus, hanging systems, screw anchors and bolts, inserts, screed supports, and miscellaneous tying devices. A convenient index on the back cover tabulates the applications of Richmond products to all types of concrete construction requirements.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 39.

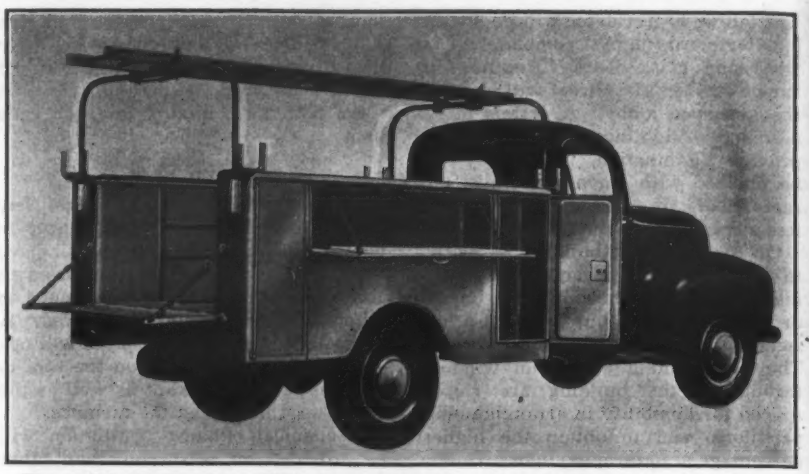
Westinghouse Executives

Westinghouse Electric Corp., Pittsburgh, Pa., has appointed three executives who will hold key responsibilities in the sale and engineering of industrial products. The appointees and their new positions are: Tomilson Fort, Manager, Apparatus Sales Department; William W. Sproul, Sales Manager, industrial products; Royal C. Bergvall, Engineering Manager, industrial products.

Utility Truck Bodies

A new line of service and public-utility truck bodies is made by Morrison Steel Products, Inc., 601 Amherst St., Buffalo 7, N. Y. The Morrison utility body is designed to fit all standard ½ to 1-ton truck chassis. It features the underbody bridge-type construction, a 48-inch inside width, offset-reinforced non-skid heavy-load floors, reinforced stamped man-carrying top, and weatherproof compartments with convenient side boxes for tools, parts, and accessories.

These truck bodies are available in six models varied to suit individual needs. The variations are in dimensions of the body, floor space, and compartment space.



The model 695 Morrison utility truck body has a floor space of 48 x 94¼ inches; side compartments provide for storage of tools, spare parts, etc. Six models are available to suit individual requirements.

Optional equipment to accommodate individual needs includes: material trays, metal sliding roof, ladder bows with hold-downs, pipe racks, pipe vise bracket and pipe rest, shelves, etc.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 60.

PROTECT

TEXACO

Contractors' Planes Save Costly Job Time

Increased use of air transportation by building and highway contractors is reported by the Ryan Aeronautical Co., maker of the Navion airplane. Among those cited by Ryan is Chester A. Weseman, Austin, Minn., contractor. Weseman keeps close contact between his Minnesota contracting operations, his Texas citrus ranch, and his Nevada gold-mine interests by means of his own personal plane. He covers 3,000 miles in 2 days during flights between the three states.

Lobnitz Bros. of Rexburg, Idaho, uses a plane in connection with its work of leveling farm lands, clearing and reclaiming brush land, cleaning and repairing canals, and excavating. L. R. Barrick, a partner in the business, reports, "The airplane saves me a lot of time getting jobs and delivering parts to different locations". H. Earl White, Marysville, Calif., also uses a Navion to haul machinery parts to outlying projects. He points out that flying to job sites for inspections and for transporting superintendents and engineers saves him valuable executive time. Morrison-Knudsen Co., Inc., Boise, Idaho, operates four planes, including one to cover construction projects in Mexico. The company considers "an ability to move quickly visiting operations" to be a principal advantage.

By keeping top engineers and executives in constant touch with the job, this all-metal Ryan Navion plane speeds work on a Pacific-Coast highway job. It has a normal range of 500 miles—800 miles with an auxiliary fuel tank.

Other contractors in varied lines report that the airplane "increases our efficiency 20 per cent . . . is very practical . . . permits executives to cover work much more often . . . we fly emergency repair parts to jobs, thereby lessening breakdown time materially . . . by flying we can cover two or three jobs in a single day". Another contractor reports that by shipping needed supplies via air, he was able to prevent a 4-day extension of one job—and at present wage rates, this represented a considerable saving to him.

Ryan quotes equipment distributors too. Lee M. Cauble, Jackson, Miss., excavating-equipment dealer, calls on customers in his Navion plane and flies them to demonstrations of machinery. He says his plane is working 100 per cent of the time it's in the air. Even on casual flights it builds company prestige.

Complete information on the Navion can be secured from Ryan. Write, on your company letterhead, to Lindbergh Field, San Diego 12, Calif.

your compressors against Rust, Water and Wear

Lubricate with Texaco air compressor oils—a complete line to meet all conditions.

NO ONE OIL can meet all the varying conditions of air compressor service. But Texaco has a complete line of air compressor oils to assure clean valves, free rings, open ports, clear air lines, whatever the type or size of your compressors . . . whatever your operating conditions.

Texaco offers straight mineral oils for regular service . . . compounded oils for use where water is present . . . oils designed to prevent rust . . . heavy duty oils for unusually severe service, or where carbon and gum are causing trouble – all highly effective in prolonging compressor life, increasing efficiency and reducing costs.

A Texaco Lubrication Engineer will gladly help you select the oils you need for best results. Just call the nearest of the more than 2300 Texaco Wholesale Distributing Plants in the 48 States, or write The Texas Company, 135 East 42nd Street, New York 17, N. Y.

HOW TO PROTECT OPEN GEARS

Best way to prolong the life of open gears is to lubricate them with the recommended grade of *Texaco Crater X Fluid*. This top-quality lubricant is liquid when applied, but quickly forms a long-lasting, tough film that guards against wear, cushions shocks, quiets noise. Economical to use—easily applied by brushing, spraying or pouring.

Lubricants and Fuels
FOR ALL CONTRACTORS' EQUIPMENT

Front-End Loader

A new series of industrial hydraulic front-end loaders with hydraulically controlled buckets has been recently announced by Ottawa Steel Products, Inc., 435 South Main St., Ottawa, Kans. These loaders are designed especially for the RTI, UTI, and UTIL Minneapolis-Moline tractors; the I-9, ID-9, I-6, and I-4 International tractors; and the LAI, DI, and SI Case tractors. A feature of the loader is that it can be mounted and used on a tractor at the same time a mowing machine is mounted and usable. One tractor thus can do the work of two, the manufacturer says, pointing out that this also eliminates the time and labor required to make a change over from loader to mower or vice versa. All tractors using the Ottawa loaders, the company says, should be equipped with heavy-duty front axles, 8 or more-ply tires as wide as possible, rear wheel weights, rear-mounted weight boxes, and 6-volt electric starting attachments.

Catalogs released by the company list the complete specifications, standard equipment, and additional equipment for each of the individual models. This literature may be obtained from the company. Or use the Request Card at page 16. Circle No. 74.

Automatic-Boiler Catalog

A catalog on the Alert automatic hot dry-steam boilers is offered by the Alert Engineering Products Co., 315 W. Woodbridge St., Detroit 26, Mich. It gives specifications for the complete line put out by the company and lists equipment furnished with each boiler.

The catalog mentions that the company's boilers are available in sizes from 2 to 50 hp, gas or oil-fired, and with steam pressures of 100 pounds or higher. They are also available without the automatic controls if desired. They are designed as packaged units complete with all fittings and safety features; the controls, the pump, and the condensate-return system are all interpiped and interwired at the factory.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 5.

Mixed-In-Place Job Covers Old Concrete

Machine Mixes and Lays One Course of Stone and Bitumen, 10 Feet Wide, At 15-20 Feet a Minute

✦ WITH neatness and dispatch, as well as economy, a smooth-riding surface was put on a 5.62-mile section of U. S. 68 in Logan County, Ohio, last summer. The old 20-foot concrete pavement, built back in 1931, had become checked and raveled over the years, and was slated for improvement by the Ohio Department of Highways. Classed as a maintenance project, since only a new surface was considered, with no widening, change of alignment, or grading involved, a contract for the improvement was awarded to C. J. Laffey, a Findlay, Ohio, contractor, on his low bid of $26,580. The job began just south of Bellefontaine and continued southwards almost to West Liberty. Only 10 working days in the month of August were required for its completion.

The big factor in the fast-moving project was a Hetherington & Berner Moto-Paver. This machine, operating over the road, accepted stone and bitumen, mixed them together, and then laid the material in a 10-foot lane as it moved along at the rate of 15 to 20 feet per minute. In Ohio highway parlance this type of job is known as T-32, Method C, road-mix construction.

Single-Course Surface

Barricades were erected at both ends of the contract, which was closed to through traffic since adequate detours were available on paralleling routes. Then the old concrete was swept clean by a Hough power broom mounted on an International rubber-tired tractor. Next a bituminous tack coat was applied to prevent the new road-mix from shoving on the old concrete. The bitumen for both the tack coat and the mix was CB AE-3, an inverted asphalt emulsion, purchased from the Central Oil Emulsion Corp., Columbus, Ohio. It was shipped in tank cars to a siding of the New York Central Railroad at Bellefontaine where it was heated to a temperature of 165 degrees F by a Cleaver-Brooks tank-car heater. The emulsion was then pumped into an Etnyre 1,300-gallon distributor mounted on an International K8 truck.

It was applied to half the width of the road, a mile at a time, at the rate of 0.1 gallon to the square yard. Operations began at the north or Bellefontaine end and continued towards West Liberty on the south-bound lane. When that half of the pavement was completed, the equipment moved over to the north-bound lane and worked on that from the south to the north end. The tack coat was covered at once with No. 6 stone, spread at the rate of about 5 pounds to the square yard through Buckeye spreader boxes hooked to the tail-gates of the stone trucks. This light covering of stone insured good traction for the trucks and Moto-Paver engaged in the road-mix work.

The No. 6 stone was also used for the single-course mixed-in-place surface. It was obtained from the National Lime & Stone Co. of East Liberty, Ohio, and was delivered to the job in trucks after an 11-mile average haul. The stone delivery was handled by H. F. Mier, a hauling contractor from Lima, Ohio, who used from 10 to 12 trucks with an average capacity of 7 tons. For every square yard of road-mix, averaging 1 inch in depth, 100 pounds of No. 6 stone and 0.85 gallon of the inverted emulsion were required.

Mixing on the Road

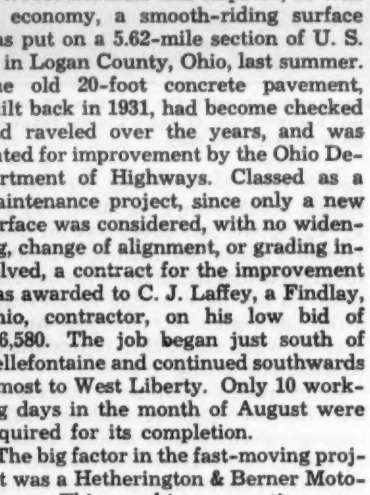
Bitumen was delivered to the Hetherington & Berner Moto-Paver by the distributor. The paver's two asphalt tanks, located on either side of the continous-mixing pugmill, have a total capacity of 1,000 gallons. They were filled within 5 minutes through a pair of 3-inch hose lines. Then the stone trucks backed up to the machine and tail-gated their contents into the hopper of the paver. The paver then pushed the truck along until all the stone was gone, when it was at once replaced with a loaded truck.

The Moto-Paver runs on 4 wheels, the driving set at the rear being powered by a Chrysler industrial engine. A mate to that engine drives the other operations of the rig. From the stone receiving hopper, the aggregate is raised on a short enclosed elevator to the continuous-mixing pugmill. There the bitumen is applied through spraybars; the machine has two bars but only one was required on this job. Mixing temperature of the asphalt was 165 degrees F. As the stone and bitumen were mixed in the pugmill, the material dropped onto the road where it was distributed by a worm or screw gear over a 10-foot width, and leveled with a strike-off bar.

At the sides of the Moto-Paver, extending out to the rear, are wing skids 25 feet long, which are instrumental in imparting an even surface to the mix. They give a sharply defined edge to the lane, and also act like a straight-edge, correcting any irregularities in the sur-

(*Concluded on next page*)

C. & E. M. Photo
An Etnyre 1,300-gallon distributor mounted on an International K8 truck loads the Moto-Paver which C. J. Laffey used on his surfacing contract in Logan County, Ohio.



a new modern line of self-priming centrifugal CONTRACTORS PUMPS by McGOWAN

• All-welded construction for lighter, stronger, more durable unit. • Automatic priming—no moving parts or jets. • Improved non-clogging impeller of special iron alloy. • Hardened wear plate, for longer life. • Fewer moving parts—hence less wear and lower maintenance cost. • Large access plates—making inspection and repairs easier. • Fully tested and trouble-free shaft seal.

SINCE 1852 McGOWAN PUMPS

All McGowan Pumps comply with contractors pump standards as adopted by the AGC.

LEYMAN MANUFACTURING CORP.
The JOHN H. McGOWAN Co. DIVISION
59 CENTRAL AVE. CINCINNATI 2, OHIO

Dealer Inquiries Invited

"Fan Mail" for DRIVE-IT
THE Money-Saving FASTENING SYSTEM
"Our savings in cost amounted to 68½¢ per anchor . . ."
"It (Drive-It) has almost unbelievable holding power when driven into concrete."
". . . use your tool exclusively in all anchoring and hanging jobs . . ."
". . . the tool paid for itself on a job of acoustical baffles we were installing . . ."
"We are finding more and more uses for this tool."
"We are pleased to advise you that the Drive-It Tools are all that you promised us."
MODEL 222
MODEL 238
U. S. Pat. No. 1,984,117; 2,400,878

DON'T DRILL IT . . . DRIVE-IT on these or similar jobs!

- Anchoring metal lath and hanging acoustical ceiling framework
- Installing metal partitions and flooring
- Attaching wood sleepers
- Hanging air conditioning and sprinkling systems
- Anchoring electrical junction boxes and conduits
- Maintenance jobs involving fastening metal objects to walls, floors or ceilings

EVEN *we* are amazed at the unsolicited enthusiasm shown by builders and construction people for DRIVE-IT. Our mail bag is jammed with letters praising the tool and the way it saves money and time on hundreds of fastening jobs.

If *your* business involves fastening steel or wood to concrete, mortar or steel, take a tip from DRIVE-IT "fans" and start saving the DRIVE-IT way.

Models for heavy and light work—over 40 types of drive-pins and four power loads for each size of tool. We'll help you choose the combination to do your fastening jobs *faster, better* and *at far less cost.*

Beat the construction cost squeeze—underbid your competition—yet make *more profits.* It *can* be done with the help of DRIVE-IT—the safe powder-powered fastening tool!

DON'T DELAY—WRITE *TODAY* for the facts on *DRIVE-IT!*

POWDER POWER TOOL CORPORATION
0705 S. W. Woods St. • Portland 1, Oregon

DON'T DRILL IT . . . DRIVE-IT POWDER-POWER TOOL

DRIVE-IT
THE MODERN MIRACLE TOOL

C. & E. M. Photos
Over the tack coat which Laffey applied to the old concrete of U. S. 68 goes a cover of No. 6 stone from a Buckeye spreader box (left). Above, with wing skids sticking out in back, is the Moto-Paver which road-mixed the surface coat of stone and bitumen.

face and removing any bumps that may have been caused by depressions in the old concrete. With the trucks providing a constant supply of stone, the Moto-Paver operated at a speed of 15 to 20 feet per minute.

Seal Coat

The single-course road-mix was rolled a couple of hours after it was placed by a Buffalo-Springfield 10-ton tandem roller. It was then choked with a light cover of No. 9 stone, applied with the Buckeye spreader boxes at the rate of 10 pounds to the square yard. This served to fill in any interstices that were left in the surface of the road-mix. The thin layer of choke stone was also rolled by the tandem roller.

When both lanes of the old concrete had been covered up by the Moto-Paver, a bituminous seal coat was applied to the entire contract, half the width of the pavement at a time. It consisted of a shot of the same CB AE-3 inverted emulsion, put on by the distributor at the rate of 0.36 gallon to the square yard, and covered with No. 6 stone at the rate of 22 pounds to the square yard. After being rolled by the 10-ton tandem roller, the resurfaced highway was opened to traffic.

The gradation of the No. 6 and No. 9 aggregate used on the contract was as follows:

Sieve Size	Per Cent Passing	
	No. 6 stone	No. 9 stone
½-inch	100	....
⅜-inch	90-100	100
¼-inch	....	95-100
No. 4	10-35	60-90
No. 8	0-5	0-20
No. 16	....	0-10

Quantities and Personnel

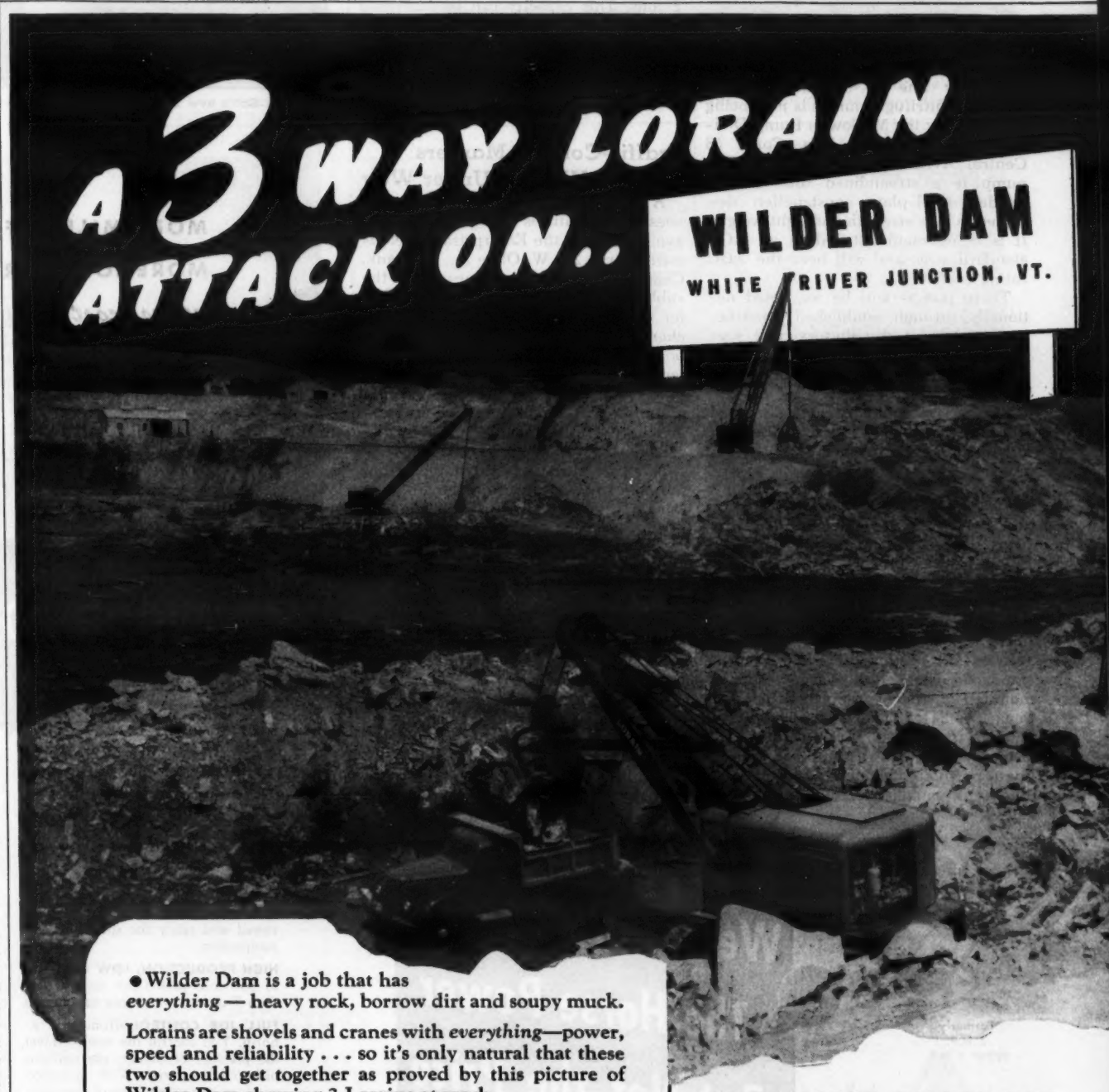
The major items of the 5.62-mile maintenance paving contract included the following:

Bitumen for tack coat	6,000 gals.
Bitumen for road-mix	56,000 gals.
Bitumen for seal coat	24,000 gals.
No. 6 stone for mix	2,535 cu. yds.
No. 9 stone for choke	245 cu. yds.
No. 6 stone for seal	560 cu. yds.

C. J. Laffey personally supervised his contract, and employed a force of from 12 to 14 men. They included from 2 to 4 flagmen for maintenance of traffic around the detours, 3 laborers, a roller operator, a man heating the bitumen in the tank cars, 2 men running the bituminous distributor, and 3 on the Hetherington & Berner Moto-Paver. Of the 3-man crew on the latter rig, one steered the machine from a position on the right-hand side; another checked on the flow of stone aggregate from the receiving hopper to the enclosed elevator; while the third man controlled the mix and the strike-off blade at the rear of the machine.

For the Ohio Department of Highways, Cotton Ford was Project Engineer, assisted by Edgar Kilgore. The project was located in the Sidney District where Oliver Liggitt is Assistant to the Chief Engineer. The Department is headed by T. J. Kauer, Director of Highways. L. F. Schaeublin is Chief Engineer of Maintenance.

Help insure America's security and your own. Buy U. S. Savings Bonds.



● Wilder Dam is a job that has *everything* — heavy rock, borrow dirt and soupy muck.

Lorains are shovels and cranes with *everything*—power, speed and reliability . . . so it's only natural that these two should get together as proved by this picture of Wilder Dam showing 3 Lorains at work.

Whether it's a big job like Wilder Dam, or a small job, you'll find a machine with *everything* you need in the Lorain line of products — a machine of the *proper* capacity for the size of job . . . the *correct* boom for the type of work . . . and the *right* mounting for your ground or travel conditions . . . and every Lorain is loaded down with design and performance features that show up where it counts — in your profit columns.

That's why your Thew-Lorain distributor is a good man to know. He can give you the complete Lorain story — can put the *right* machine in the *right* place to do the job *right*. Your name on a Lorain is a good sign your job is making money. Check the Lorain story today!

THE THEW SHOVEL CO., LORAIN, OHIO

THEW-LORAIN 1899 50th ANNIVERSARY 1949

OVER 75 LORAINS TO CHOOSE FROM

3 series of models in a wide range of capacities; with 5 interchangeable booms; available on crawler or on rubber tires as engine self-propelled or 2-engine Moto-Crane mountings.

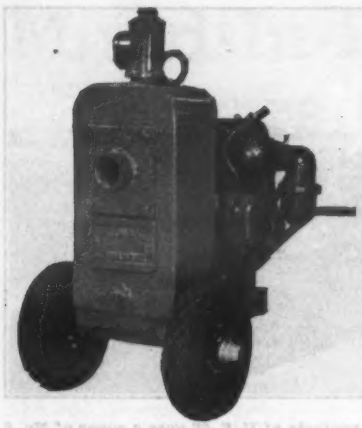
FACTS ABOUT WILDER DAM...

CONTRACTORS . . . New England Power Service Company, Boston and United Engineers and Constructors, Inc., Philadelphia.

PROJECT . . . To furnish power for two 16,500 K.W. generators. Center of dam 966' long, 70' high . . . 50,000 yds. of concrete required . . . Excavation — 45,000 yds. of rock, 45,000 yds. of earth and 30,000 yds. of borrow fill.

THEW Lorain

SHOVELS • CRANES • CLAMSHELLS
DRAGLINES • HOES • MOTO-CRANES



Strength and light weight are claimed for the new McGowan line of self-priming centrifugal pumps.

Centrifugal Pumps; Self-Priming Action

A new line of contractors' self-priming centrifugal pumps is now being produced by the McGowan Pump Division of the Leyman Mfg. Corp., 58 Central Ave., Cincinnati 2, Ohio. The pump is a streamlined unit of all-welded steel-plate construction designed to give strength and light weight. It is being manufactured in all AGC standard sizes and will bear the AGC rating plate.

These pumps will be marketed nationally through established construction-equipment distributors, and several territories remain available for distributors who might be interested in the product.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 119.

A Unit Batch Plant

A new small portable unit batching plant has been developed by the Gar-Bro Mfg. Co., 2416 E. 16th St., Los Angeles 21, Calif. This unit, which will charge a ½-yard or 16-S mixer, is designed to handle material requirements which vary from job to job.

Essentially the plant consists of a standard center discharge hopper mounted in a steel frame high enough to carry a 24-cubic-foot or 3,000-pound batcher underneath. From two to six of these units can be assembled to make up a portable batching plant of any number of compartments and of almost any capacity desired.

To permit moving the batching plant about as a single unit on a job, an 8-inch channel skid is provided to which units can be bolted. The company states that the plant can be moved as a whole from one job to another with any number of units bolted together. By removing a few bolts, it can be moved as separate single-bin units, the same as a floor hopper. The frame supporting the hopper can be knocked down for shipment. When the plant is disassembled and not being used for batching, the hopper in each unit can be used as a concrete hopper. The company says that it is not necessary to use a crane to assemble or move the plant.

Each hopper has a water-level capacity of 81 cubic feet or 4 tons, and a heaped capacity of 100 cubic feet or 5 tons. This capacity can be increased by using wooden side boards up to 3 feet high.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 120.

Traffic-Control Markers When Work Is Under Way

A 4-page illustrated folder on the uses and features of Trafficones is available from the Enterprise Development Corp., 231 W. Olive St., Burbank, Calif. The catalog explains that the rubber Trafficone markers may be used for a variety of traffic-control and channeling operations while a street or road is under construction or maintenance repair work. It mentions that, in addition to the red and yellow cones, a luminescent Trafficone for night traffic safety is also manufactured by the company.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 30.

Arc Welder, 170-Amp

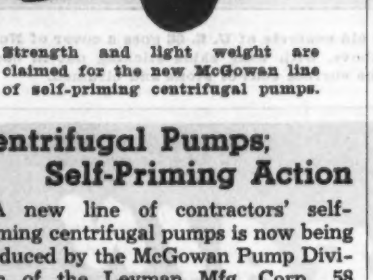
A two-color single-sheet bulletin on the Model 170 arc welder is available from Birdsell Mfg. Co., Inc., P.O. Box 733, Los Altos, Calif. One side of the bulletin lists twelve construction and operating features of this 170-ampere ac arc welder, and pictures it. On the reverse side are specifications, operator's instructions, and hints for obtaining good welds.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 138.

Gar-Bro's new unit batching plant in action at a reservoir for Glendale, Calif.

Formerly 3 H.P. NOW 4 H.P.

We've Increased The Horse Power But Not the Price



Formerly 1½ H.P. NOW 2 H.P.

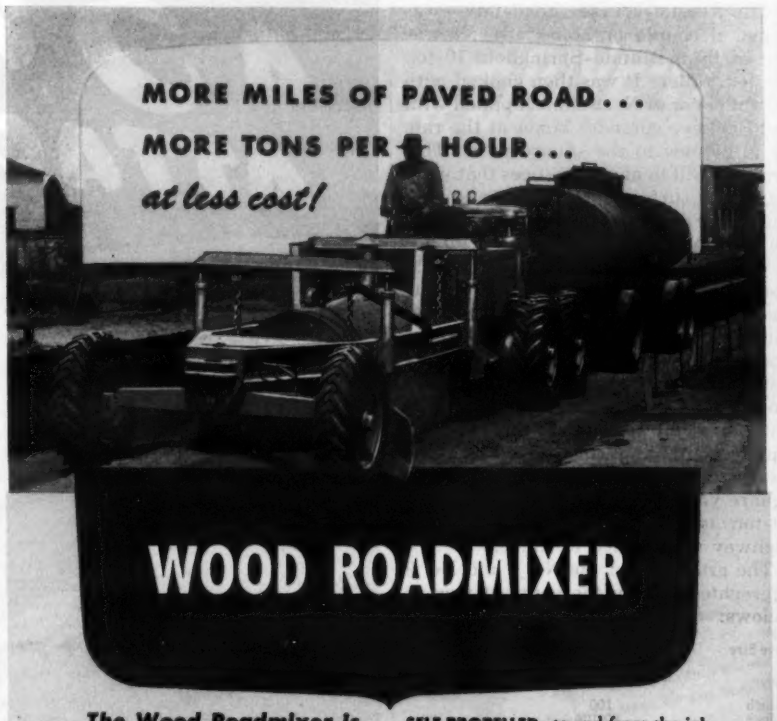
of Mall GASOLINE ENGINE Concrete VIBRATORS

Now . . . you get one-third more power at no extra cost when you buy Mall Gasoline Engine Concrete Vibrators. In addition to providing greater power for *vibrating*, and other attachments for *wet-wall rubbing, form sanding, wire brushing, grinding, pumping, sawing, drilling,* and *sharpening tools*, it is a definite advantage in higher altitudes as the increase in power more than compensates for power loss due to elevation above sea level. Another good reason why Mall Concrete Vibrators should be your first choice on all jobs where vibration is specified.

Write Contractors' Equipment Division for FREE Booklet "Mall Concrete Vibrators," and name of nearest dealer.

MALL TOOL COMPANY, 7743 South Chicago Ave., Chicago 19, Ill.

Established 1921



WOOD ROADMIXER

The Wood Roadmixer is your best answer to modern low cost mix-in-place construction. Here's why:

LESS MANPOWER—this *one man operated* traveling mixing plant takes low cost native materials and thoroughly mixes with emulsion, road oil or soil cement binders in one pass—windrowed and ready for spreading and compaction.

HIGH PRODUCTION, LOW COST—up to 330 tons mixed per hour at less than 7 cents a ton is not uncommon.

FULL JOB CONTROL—from start to finish. You control the rate of travel, the pressure of binder, the uniform pickup of material. With measured windrow and supervision of aggregate you're assured a surface of uniform quality every time!

3 MODELS AVAILABLE

Self-propelled Models 42 and 36 and tractor-drawn Model 34. Write today for complete information and prices.

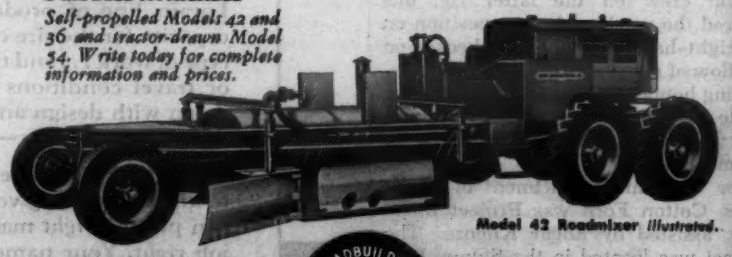
SELF PROPELLED—to and from the job speeds of 15 MPH and working speeds up to 40 ft. per minute!

MORE THOROUGH MIXING—pug mill mixing drum provides 200 mixing passes in 45 seconds! Compare this to the 1 to 4 passes provided by other mixers.

MANEUVERABLE as a motor patrol—uses pneumatic tires. Assures adequate traction in low bearing soils.

PLENTY OF ROADBUILDING APPLICATIONS—surfaces secondary roads, airfields, road shoulders, parking areas and detours. Subsurfaces major roads and airfields.

ACCEPTED AND RECOMMENDED by a majority of state highway departments, by the Civil Aeronautics Authority, U. S. Bureau of Public Roads, and the U. S. Army and Navy.



Model 42 Roadmixer *illustrated.*

ROADBUILDING EQUIPMENT

WOOD MANUFACTURING CO.

BOX 620 · 6900 TUJUNGA AVENUE · NORTH HOLLYWOOD, CALIF.

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Relief Sewer Laid Under City Streets

Back-Pressure Problem Whipped As Crews Lay Large-Diameter Concrete Lines for 6½ Miles

By RAYMOND P. DAY,
Western Editor

+ IN the neighborhood of 74th Street and Vermont Avenue, in the city of Los Angeles, Calif., the day following Sunday is known as Monday. People go back to work, do their shopping for the early part of the week, and wash. Normally it is an uneventful day.

This one wasn't.

Nich. M. Mlagenovich, General Superintendent for the Los Angeles contracting firm of Artukovich Brothers, looked down the ditch and swore. Weatherbeaten, and wiry from chasing pipe-line equipment up and down trench jobs for more than a quarter of a century, "Nick"—as he is known to waterworks contractors all over Los Angeles—has seen many a mean job in his time. If what he saw this Blue Monday wasn't the worst, it was a mighty close second.

Sewer water oozed through the ground. Raw sewage dripped from the walls of the ditch. The big 36-inch sewer line which Nick and his gang had started now lay almost covered in a mess of foul water, filth, and mud. Trouble had come suddenly. Now, too late, Nick realized its cause.

Parallel sewer lines, themselves overloaded, were getting old. The interceptor sewer was overloaded, too—this was why the job was being done. The outletting sewer, brimful with a sudden peak output, was backing up in the old parellel line and flooding the new trench from a broken pipe. What nobody had figured out, up to now, was the fact that this was Monday—wash-day! Wash water was flooding the lines.

The right decisions, arrived at rapidly in the field, can make or break a sewerage pipe-line job. Mlagenovich got busy—not that he isn't always that way.

Pumps were ordered. Everything was made ready for the switch. That night about 11, when the flow was low in the interceptor manhole, he and his crew moved in.

They blocked off the end of the line which carries waste from homes to the main sewer. They used a tee for this; cemented it in tight. This prevented pressure from backing up in the lines. But continuous service also had to be maintained, so the crew installed a riser pipe up almost to the top of the manhole. They stuck the suction end of a 2½-inch pump in this riser, started the pump, and simply pumped the sewage only a few feet, discharging it back into the manhole where it could go on down to the outfall.

The local sewerage line then started to work normally again, with a minimum of leakage from the break. And the interceptor sewer could also carry off the load as before, but without backing up.

This method is now being used generally to whip one of the most troublesome problems on an unusual project.

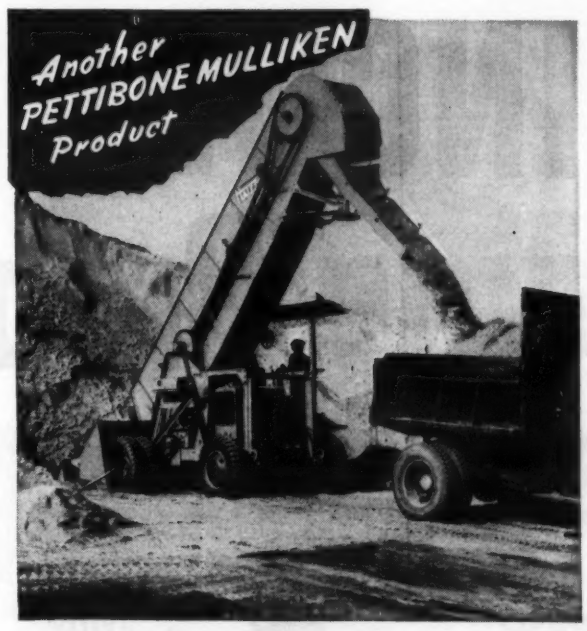
Need New Sewer Badly

The job calls for almost 6½ miles of new 36 and 54-inch reinforced-concrete pipe line, designed to relieve the load on the near-by lines which are operating at above-normal capacity. The line is going in through a thickly settled residential part of Los Angeles extending between Slauson and Manchester Avenues and Avalon Boulevard and Van Ness Avenue. At a contract cost of $1,087,000, the work is being pushed by the successful low bidder, Artukovich Brothers of Los Angeles.

(*Continued on next page*)

C. & E. M. Photo

A big Austin 800 trencher prepares to go to the bottom of a trench with its boom as excavation for the Los Angeles relief sewer is started again after a turn.



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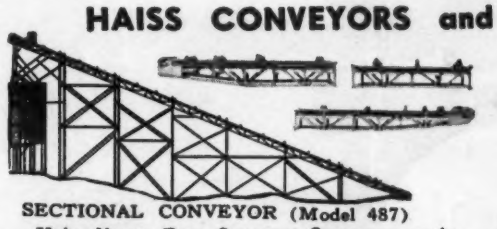

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Relief Sewer Laid Under City Streets

(Continued from preceding page)

Designed and supervised by the City Engineer's office of the City of Los Angeles, the job was actually begun late in November, 1948. It is scheduled to be finished by August, 1949, according to the Board of Public Works.

Los Angeles has grown so rapidly in the past decade that extensive new sewerage works are needed. The Artukovich job will relieve the present overloaded condition of the lines in the area affected by the contract. Some $41,000,000 worth of new work is under way at Hyperion, also, in connection with the new activated sludge plant. (See C. & E. M., Jan., 1949, pg. 17.)

The Artukovich contract contains the usual odd and specialized items of manholes, junction chambers, vitrified-clay pipe in small diameters, resurfacing of street pavement, and the restoration of curbs. But the main items under the contract are 12,683 linear feet of 54-inch concrete pipe, and 9,867 linear feet of 36-inch concrete pipe.

The pipe, made by a centrifugal spinning process, and reinforced, is being made for and delivered to the job by American Concrete Pipe & Construction Co.

Unusual Street Problem

Extensive though the job is, it is entirely within the city and passes entirely through city streets. Traffic congestion is such a problem that all the main intersections, such as Broadway, Vermont, and so on, have to be kept open. The sewer will be laid at these intersections by tunneling a 6 x 7-foot opening under the streets, and then laying the heavy pipe sections with a special Garlinghouse tunnel pipe-laying jumbo.

One of the first operations of all to shape up as a big job has been the demolition of pavement ahead of the trench excavation. Arrangements for this work have been made with Emsco Concrete Cutting Corp. of Los Angeles, which supplies the specialized equipment and a crew for this work.

Normally the city streets are bituminous pavement or asphaltic concrete about 4 inches thick, and the truck-mounted Emsco heavy pavement breaker can break 600 feet of pavement 6 feet wide in about three hours, and go on to another job if necessary. Such was the case the day CONTRACTORS AND ENGINEERS MONTHLY visited the project.

On Figueroa Street, however—as well as on other streets to come along later—the pavement was something to test the mettle of heavy equipment. There was an old 10-inch portland-cement concrete pavement there originally, and it had been covered at various times with asphaltic concrete which averaged 8 inches thick. Near 74th Street the asphaltic concrete reached 10 inches in thickness.

On pavement this heavy, the sides are first marked off in yellow crayon, according to surveyor's stakes already set in. The Emsco pavement breaker, using a heavy wide tool, then breaks or cuts out a groove along the center line of the ditch. Cutting this center line first prevents pavement buckling along the sidelines, and it gives the operator an open spot to work to. Once the center cut is finished, most pavement will crack off in fair shape.

Arrangements have been made with gas, water, and other utilities companies to tie off or by-pass the utilities temporarily after the pavement breaker has finished. Crews for these companies excavate the holes by hand or with pneumatic equipment, as a rule. These operations are conducted in such a way that utilities service to residences is cut off for only a few hours at most—long enough to let the big trench excavators move in and cut the trenches to line and grade.

C. & E. M. Photo

A Lorain Moto-Crane on the Los Angeles sewer job picks up and lowers into the ditch a section of concrete pipe.

If it were not for these arrangements, the trench excavation would be slowed down by literally hundreds of existing utilities lines which intersect the location of the sewer usually only a few feet below the street surface.

Selection of Equipment

Artukovich Brothers is a specialist firm in the sewer and pipe-line field. It is equipped to handle pipe trenches of any size up to 9 feet wide and 30 feet deep. Average ditches on this project were 6 feet wide x 18 feet deep, although some 8 x 24-foot trench will be dug.

The equipment selected was designed to handle the deep trenches, heavy excavation, and backfill, and the heavy lifts of this project.

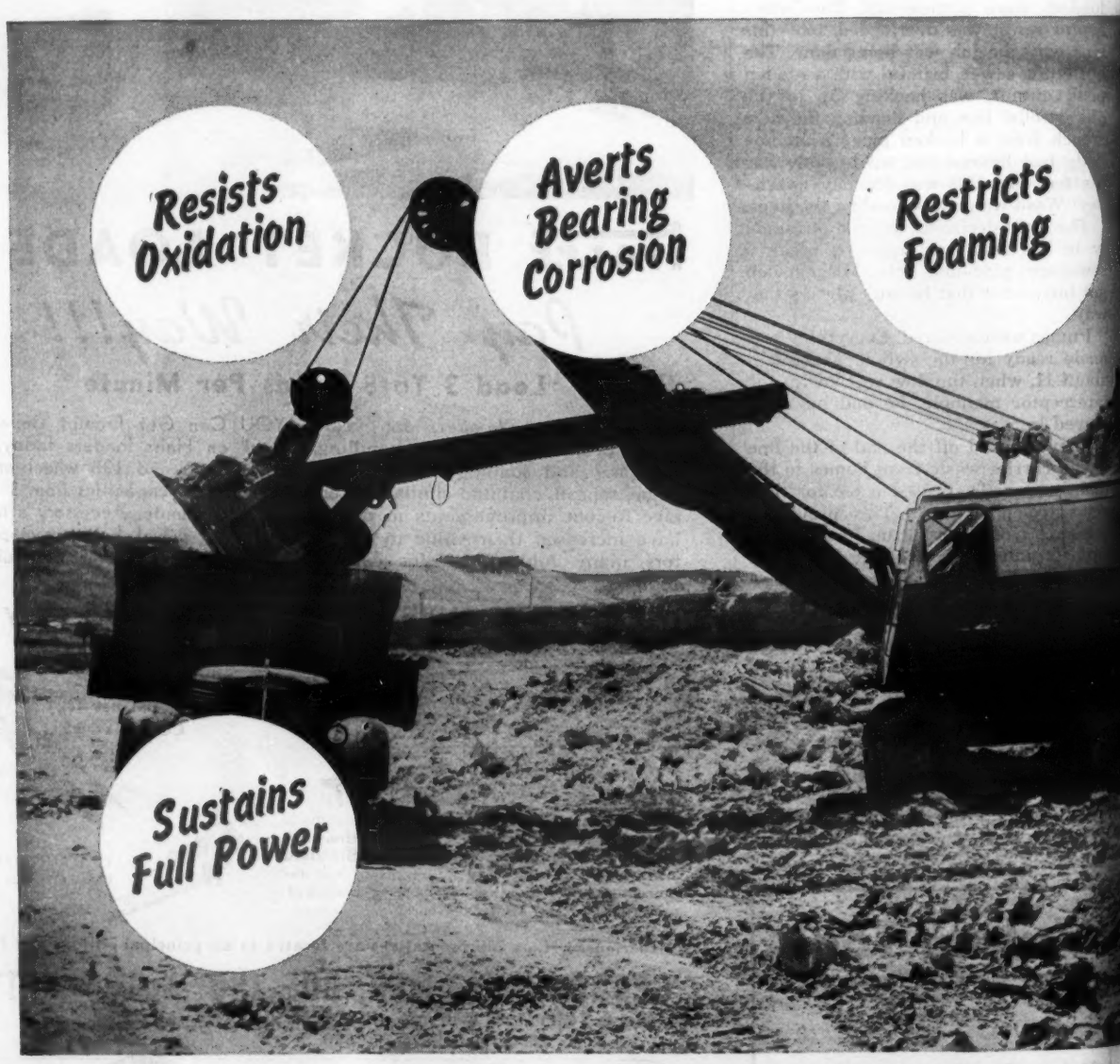
Power trenching equipment consists of a large Austin 800 machine, powered by a Twin Cities gasoline engine. A Parsons 310 Trenchliner is handling some of the lighter work. For trench excavation around sharp curves and

(Continued on next page)

C. & E. M. Photo

Looking down the ditch line, we see all the bracing required for a trench of this size—6 x 25 feet.

SINCLAIR TENOL Problem in



SINCLAIR

YOUR NEAREST SINCLAIR AGENT WILL GLADLY ARRANGE

near curbs, a Bay City ⅝-cubic-yard truck crane with an Owen clamshell bucket is being used, with two rented Ford dump trucks to haul the material away.

Because the job is all on city streets, it has to be closed up within about 1,000 feet. This means the dirt from the big Austin trenching machine must be dumped to a fleet of trucks which haul it back to where the pipe laying is completed. The dirt can then be dumped in for backfill. The hauling fleet for this work consists of new International trucks with Gar Wood hoists and bodies: three KB-11's and two KB-8's.

A ⅝-cubic-yard Link-Belt Speeder truck crane and a new Lorain Moto-Crane of the same size are also on hand, alternating between placing the pipe sections and helping out with the clamshell work.

An International tractor with a McCaffrey-built front-end loader loads out excess dirt and helps with the backfill. Final backfill dressing is done by a Caterpillar No. 12 motor grader; a Bucyrus-Erie 15-B machine used as a crane, with a 2½-inch water jet, is being used to flood the backfill over the pipe.

C. & E. M. Photo
On the Artukovich Brothers sewer contract, an International truck dumps a load of backfill on the concrete sewer pipe.

Tunneling equipment includes two Le Roi 215 portable air compressors, two Gardner-Denver pneumatic guns with clay spades for excavation, and two 20-kw Kohler light plants. Garlinghouse Brothers of Los Angeles is currently working out an ingenious counterbalanced tunnel pipe-laying jumbo which will handle the 9-ton pipe sections in cramped quarters without difficulty.

Two double-diaphragm Domestic pumps and a Gorman-Rupp centrifugal machine keep the parellel sewer lines and the manholes under control to prevent the trench from flooding out because of back pressure. The lesson at Vermont Avenue, where the job began, was a valuable one. It was learned well.

Sequence of Work

Work behind the initial pavement breaking follows a well defined sequence, despite the fact that numerous troublesome situations come up constantly. As these situations arise, they are handled to the best advantage of the job. For that reason, the job has been set up with a great deal of latitude by the foremen and superintendent. If trouble looms ahead, they can slow down to meet it. If a short cut is possible, the operation is flexible enough to speed up. Underground pipe-line work is not like work above ground, where everything can be seen. It is full of intangibles and loaded with unseen circumstances. A crew has to be prepared to meet these.

Under ordinary operating conditions, the trench is first excavated to within about an inch of grade by the Austin trenching machine. This big machine rolls along on steel wheels and a set of crawler tracks. In ordinary digging, no planking is necessary under the wheels. The machine can dig to a variety of depths by raising or lowering its boom, which carries the endless bucket chain. H. & L. detachable teeth are used on the buckets.

Bracing starts even before the trench reaches its full depth. A crew of six men work close to the trenching machine. When it stops for a minute or so between trucks, one of the men places short temporary 2 x 8-inch brace boards on from 5 to 7-foot centers, and spreads them with a Duff-Norton trench jack.

Full trench bracing then follows as soon as the machine moves forward from 5 to 7 feet. This usually consists of 2 x 10-inch boards, placed vertically on each side of the trench and spread by three trench jacks for an 18-foot board. The top jack is within about 2½ feet of the street surface, and the lowest one is near the bottom of the trench.

Where the ground is bad, bracing exceeds the standard safety codes. Where there is any doubt at all about the safety of the ground, 3 x 10 wales are used horizontally. They are spaced as necessary and spread by three jacks. While a great deal of bracing lumber is used each day, the operation stays right up to the trenching machine. As the braces are pulled farther down the line, where backfilling is done, a truck hauls the jacks and timbers ahead to the trencher, where the boards are used over and over.

A grade man is next in the construction line-up. Precise flow-line grade stakes are set every 25 feet, close behind the machine.

"We're as much interested in accurate grades as the City is," explained the General Superintendent. "Good grades give our pipe a firm, full bearing. With the kind of backfill load we've got here, we have to have full-length bearing on tight soil."

At any rate, the grade stakes are set, and a laborer with a shovel lightly skims off the inch or so required to insure the right bearing. The trench is

(Concluded on next page)

Ends Sludging Diesel Equipment

A major problem of diesel engine operation is the formation of sludge, gum and varnish on valve stems, rings and other engine parts, which causes engine drag, increased operating costs and frequent tear-downs.

This problem is solved by the use of Sinclair TENOL for diesel engine lubrication. Sinclair TENOL contains special Sinclair-developed additives to prevent the formation of sludge, gum and varnish. TENOL holds these harmful elements in suspension so that they are drained out with the oil at oil change periods.

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Relief Sewer Laid Under City Streets

(*Continued from preceding page*)

excavated to the line of the pipe barrel. Slight depressions for the concrete pipe collars are mucked out by hand labor as the 8-foot-long sections are set.

The concrete pipe sections weigh 4½ tons for 36-inch diameter; 9 tons for 54-inch. They are lowered to the bottom of the trench by a crane, using cable slings and a sliding hook. When they reach the bottom, the bell and spigot ends are joined, the pipe precisely placed, and the cycle is repeated.

A mortar crew works along several joints behind the placing. The joints are filled from the inside and from the outside. Mortar consists of one part of portland cement to one and one-half parts of fine sand, mixed to a smooth, easy consistency. The joints are made up with this mixture so they will be water-tight under a gravity flow.

Backfill is carried on in such a way that the dirt is not dumped on the fresh joints; it is dumped on previous backfill and rolls forward. After the pipe has been covered a few feet, direct dumping is then permitted. Because of the danger of the rainy season and the necessity for keeping the job closed up as tight as possible as it goes along, full-depth backfilling in one operation is permitted.

A Bucyrus-Erie 15-B crane with a 20-foot jet pipe then moves in. Water is fed to the 2½-inch jet pipe through several hundred feet of fire hose hooked to city hydrants along the line. The jet is lowered through the backfill near the pipe, and the flooding water compacts the fill. Ordinarily the dirt settles about 3 feet. This void is then filled by dumped material, smoothed off by motor grader, and compacted by the action of the wheels.

Tunnel Work

The 6 x 7-foot tunnels are being driven largely through very easy material. The sandy formation yields readily to pneumatic clay spades. As the material is dislodged, workmen shovel it to wheelbarrows and dump it outside the tunnel mouth, where one of the truck-crane clamshells loads the material out several times a shift.

Every 5 feet, the tunnel is braced with 6 x 6 timber supports. Two vertical supports, capped by a 6 x 6-inch timber, are used. Lights for the tunneling operation come from the Kohler light plants. Tunneling operations are, of course, carried on ahead of the main trenching operation.

The special pipe-laying jumbo, which moves 9-ton pipe sections with ease within the tunnel, was made by the Los Angeles manufacturing firm of Garlinghouse Brothers. It is a counterbalanced device, with a boom for picking up and lowering pipe sections.

Personnel

The project was planned under the general supervision of Lloyd Aldrich, City Engineer for the City of Los Angeles, with Merrill Butler, Deputy Engineer, and E. G. Studky, Engineer of Sewer Design. Inspection of construction is under the supervision of Ted Neiderhofer, Inspector of Public Works, City of Los Angeles.

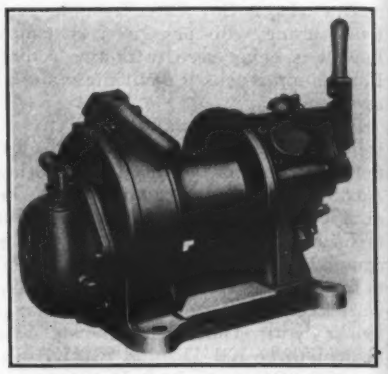
For Artukovich Brothers, Bob Bangar was in charge of job purchasing and timekeeping, Lee Stewart was Master Mechanic, Carl Douglas was in charge of equipment, Paul Telles was Trench Foreman, Martin Mlagenovich was Backfill and Clean-Up Foreman, and John Kless was in charge of tunnel operations.

Midget Air Hoist

A new midget single-drum utility hoist has been announced by the Ingersoll-Rand Co., Phillipsburg, N. J. Known as the Size BU, the hoist serves a variety of hoisting, skidding, and hauling jobs. The company states that the BU will lift a 600-pound load at 50 feet per minute and that heavier loads may be handled by use of proper sheave blocks.

Measuring 18½ inches long x 10¾ inches wide and 11¾ inches high, the Size BU is a compact, lightweight (72 pounds less rope) hoist that may be carried, installed, and used almost anywhere by one man.

It is powered by a reversible 4-cylinder radial piston-type air motor. A wide band-type brake gives positive holding power while the reversible motor permits the lowering of the load under power. When cable is to be pulled out quickly, the operator can readily disengage the drum by means of a convenient clutch lever.



A 600-pound load can be lifted at a rate of 50 fpm by the new Ingersoll-Rand Size BU utility air hoist.

Further information maye be secured from the company. Or use the Request Card at page 16. Circle No. 50.

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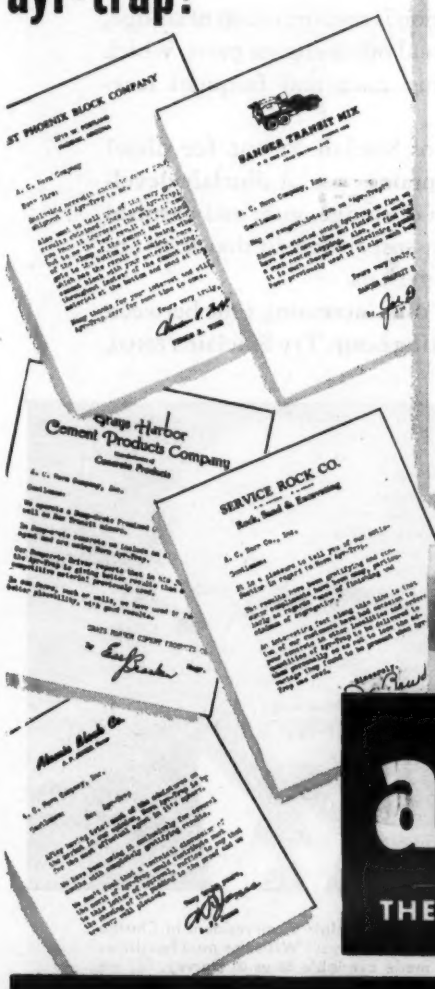

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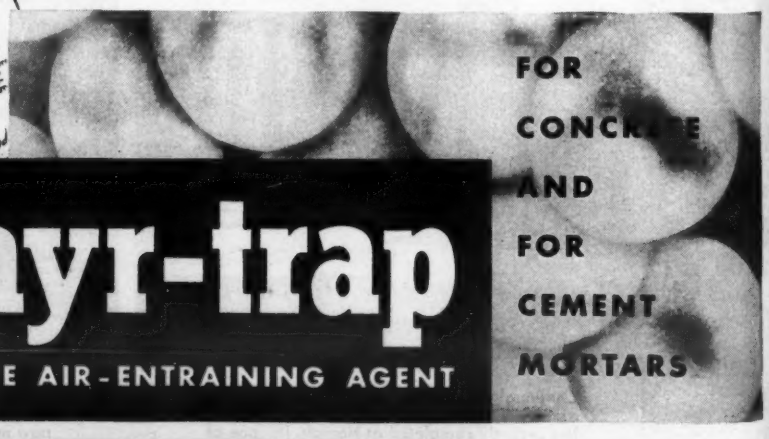

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Four-part bridle slings like the one illustrated above are handy devices for hoisting large rectangular loads. In this view, a Yale ¼-ton trolley-mounted hoist is in use. The safe loads for this kind of sling, using standard wire-rope cable, are indicated in the chart at right.

Four-Part Bridle Sling

A 4-part bridle sling for hoisting large rectangular-shaped loads is a handy device to have around a shop, garage, or any place where loads of this type are involved. It can also be used to hoist a large basket containing small parts.

The photo at the left shows such a sling in use, with a Yale hoist handling the load. The ends of the sling cables are permanently secured to the frame; thimbles at the hoist end prevent wear. The safe loads which various types and sizes of these slings can be used to lift are indicated in the accompanying chart which was prepared by The Yale & Towne Mfg. Co. of Philadelphia.

SAFE LOADS			
Sling Size	60°	45°	30°
1/4"	2,100	1,700	1,150
3/8"	4,900	3,900	2,700
1/2"	8,500	7,000	4,700
5/8"	13,000	10,500	7,200
3/4"	19,500	15,500	10,500
7/8"	25,500	20,000	14,000
1"	32,500	26,000	18,000
1-1/4"	49,000	39,000	27,000
1-1/2"	72,000	57,000	40,000

Courtesy of The Yale & Towne Mfg. Co.

McDaniel Joins Marquette

John E. McDaniel, Jr., has been appointed to the service engineering staff of Marquette Cement Mfg. Co., Chicago, Ill. He will operate out of the company's Memphis, Tenn., sales office as Service Engineer for the southern area. He was previously employed as a civil engineer with the U. S. Corps of Engineers.

Levels, Theodolites, Drawing Instruments

A line of precision surveying and drawing instruments is now available from the Henry Wild Surveying Instruments, Inc., 26 Court St., Brooklyn, N. Y. These instruments are manufactured by Henry Wild Surveying Instruments Supply Co. Ltd., Heerbrugg, Switzerland.

The Wild levels come in three models: the N I, with a magnification of 18X, the N II for 24X or 28X, and the N III for 42X. The range for one-centimeter (0.394 inch) reading is 700, 1,000, and 1,500 feet respectively. The attainable accuracy claimed for 1 mile of single leveling is ± 0.25, ± 0.12, and ± 0.01 inch respectively. All are available with or without the horizontal circle. Tripods and leveling staffs for each of the models may also be obtained.

For precise surveys Wild makes three theodolites: the new Double-Centre theodolite T1, the Universal theodolite T2, and the new Precision theodolite T3. Electric lighting, special targets, carrying cases, and tripods may also be secured.

For the draftsman the company manufactures four sets of drawing instruments. These range in size from the two-piece pocket-size RZ 10, through the intermediate-size kits the RZ 20 and RZ 30, to the large fully equipped RZ 40.

Further information and literature concerning these products may be obtained from the American firm. Or use the Request Card bound in at page 16. Circle No. 48.

New Snow-Plow Catalog

A 24-page catalog on truck snow plows has been issued by The Baker Mfg. Co., 2573 S. 10th St., Springfield, Ill. Bulletin 1002 is illustrated with large views showing the design and construction of the complete line of Baker truck plows. It includes dimensions and specifications to help users determine the plow to suit their requirements.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 118.

The JIFFY Stake Puller

Different! —Works like a pump!

No more bending down to attach jaws to the pin by hand. . . . Attach by the handle . . . then an easy push downward lifts out the pin. Easy to operate. Pays for itself in a week. You get your forms ahead faster for resetting.

With a JIFFY Stake Puller you can drive pins flush with the top of your forms. This means better "strike-off" work and insures the best of concrete.

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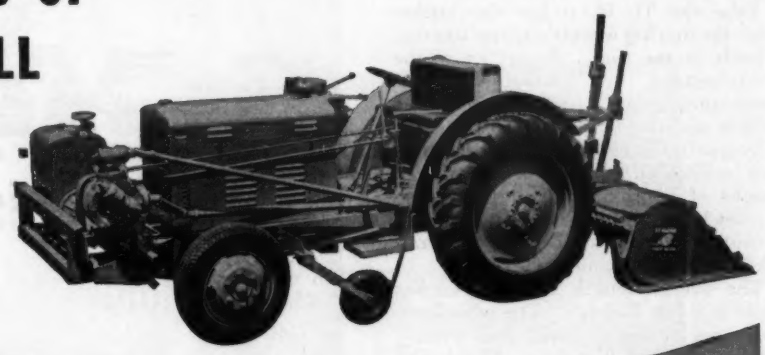
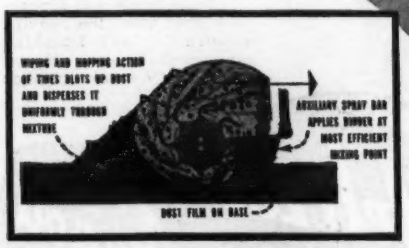
NEW STANDARDS OF PRECISION IN ALL ROAD-MIXING . . . NEW HIGHS IN DAILY OUTPUT



WITH THE NEW SELF-PROPELLED SEAMAN TRAV-L-PLANT


WIPING AND HOPPING ACTION OF TINES BLOWS UP DUST AND DISPERSES IT UNIFORMLY THROUGH MIXTURE
AUXILIARY SPRAY BAR APPLIES BINDER AT MOST EFFICIENT MIXING POINT
DUST FILM ON BASE

A Superior Road-Mix at far less cost

Rotating tines *clean* sub-grade, lift soil and aggregate and throw it all-directionally. Breaks soil into minute particles to blend with binder uniformly throughout full depth of treatment. Pitch and curvature of tines throw material *laterally* and *transversely* to blend equally.

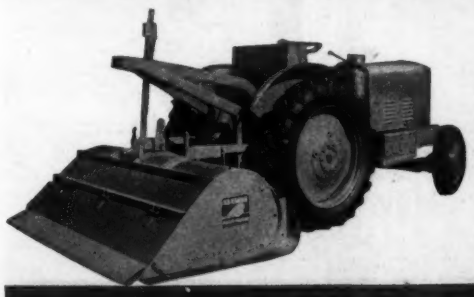
Spillover ahead of rotor and carry of materials within trailing edge of hood (as far as 50 feet) result in continuous remix,—positive uniformity and intimacy of mix-in *longitudinal* travel. Uniform distribution of coarse and fines with a thin distribution of fines over entire surface is due to curvature and ironing and leveling action of mixing chamber.

Here's the time-tested, internationally accepted SEAMAN Pulvi-Mixer built into a rugged, powerful, entirely *self-propelled* unit. And, through a wide range of gear selections and engine settings the TRAV-L-PLANT mixes at any rate of forward travel from 100 feet to 600 feet per minute. Thus efficient mixing for *any* stabilization under *any* condition is merely a matter of choosing the proper rate of forward speed. There's a road gear, too, for transport.

MORE! The Self-Propelled SEAMAN TRAV-L-PLANT is equipped with spray bar, pump and tachometer for the application of bituminous material or water immediately ahead of the mixing rotor. No migration. No evaporation. No variables in application. . . . Close-coupled, the SEAMAN TRAV-L-PLANT turns at the section-end as shortly as a tractor. All controls in instant, natural access to operator. View of work ahead and mix behind is clear and unobstructed.

THE SEAMAN SELF PROPELLED PULVI-MIXER

The SEAMAN TRAV-L-PLANT gives you more square yards per day, — absolute control of mixture, ample power for every job — all at far less operating cost and at far less investment than other mixing methods.



● Every benefit of the TRAV-L-PLANT is offered in the Self-Propelled SEAMAN MIXER except the spray bar, pump and tachometer are not installed. Ideal for work with bituminous distributor or sprinkler and of course, is available at less initial cost.

A NEW BULLETIN — just off the press completely describes the Self-Propelled TRAV-L-PLANT. Seaman Motors' address is below. Please use it in asking for this illustrated, detailed literature.

SEAMAN MOTORS, INC.

282 NORTH 25th ST., MILWAUKEE, WISCONSIN

The second rubber-tired loader in the Tractomotive line is this new model TL-B 10-cubic-foot Tracto-Loader.

Rubber-Tired Loader Has a 10-CF Bucket

Another materials-handling tractor, the Model TL-B Tracto-Loader, is announced by the Tractomotive Corp., Deerfield, Ill. It has a 10-cubic-foot standard bucket, and is similar in design to the ½-cubic-yard TL-W.

Like the TL-W, it has the bucket over the driving wheels and the steering wheels in the rear. According to the manufacturer, this feature results in good traction and easier steering. The unit is mounted on rubber tires and has a hydraulically controlled bucket which can be dumped in whole or in part to a height of approximately 5 feet. The bucket has a forward crowd action and an automatic tilt-back feature to permit loading without ramming.

The overall length with the bucket down is 9 feet 5 inches. The wheelbase measures 4 feet 1 inch, and overall width is 4 feet 6 inches. The brake horsepower is said to be 27.8.

The TL-B is designed primarily to handle bulk materials in congested areas, where working space is small. According to the manufacturer, it will handle 20 to 25 tons of most bulk materials per hour on a 300-foot round-trip haul.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 38.

Timber-Saw Catalog

A 4-page two-color folder on the Titan Bluestreak timber saws for falling and bucking is available from Mine & Mill Supply, Inc., 2700 Fourth Ave., S., Seattle, Wash. The bulletin describes the applications and the features of the chain saw, the saw with bucking-bar attachment and handles, and the model with the bow-saw attachment. It covers in detail the saw motor, controls, self-winding starter, chain-oiling system, swivel device, cutter bar, etc.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 25.

A Heavy-Duty Engine For New Truck Line

A new Gold Comet heavy-duty gasoline truck engine has recently been introduced by Reo Motors, Inc., Lansing 20, Mich. At the same time the company announces that this engine will power the new E-22 truck series, covering a weight range of 17,000 to 22,000 pounds as a truck and 22,500 to 35,000 pounds as a tractor.

The 6-cylinder engine features the wet-sleeve principle with removable cylinders. The Gold Comet has a 331-inch displacement and a square bore and stroke (4⅛ x 4⅛-inch). It is designed to develop 140 hp at its governed speed of 3,200 rpm. It has a two-way water circulation about the cylinder to insure even cooling. Three separate water outlets are also a design feature for better cooling.

The E-22, the company states, features a new truck design with a massive-looking front end, modern lines, and increased driver comfort. In addition, it retains the Reo More-Load design which permits full load to be carried on a shorter wheelbase. The frame is cold-riveted, reinforced by five heavy cross-members for the E-22's 130-inch wheelbase.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 70.

Highlights Dealer Service

A 12-page two-color booklet called "Let's Take a Look at Your Caterpillar Dealer" has recently been released by Caterpillar Tractor Co., Peoria 8, Ill. Its purpose is to highlight the workings of the world-wide distribution organization maintained by the manufacturer.

The folder is expected to give the reader an insight into the parts and service facilities afforded him by the distributor. Parts handling and service facilities of various distributor companies are pictured.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 127.

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Superior Quality
BLADES
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For any make of machine
Motor Graders, Maintainers, Scrapers, Dozers, Bulldozers, Backfillers, Wagon Scrapers, Trail Builders, Trail Blazers, Carryalls. Also—
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SCARIFIER TEETH
50 years of manufacturing blades has developed for you a special steel, milled through our own rolls and forged at the edges to give that extra wearing quality you need.
All widths lengths, and thicknesses, UNPUNCHED ready to fit your machine.
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STEAM HEATER

provides steam in two minutes time

FROM A COLD START—Here's a steam producing unit for Unloading Tank Cars that gives 200 lbs. of steam pressure in two minutes time. It is the fastest steam producing unit on the market today. It's designed to unload tank cars of Asphalt, Tar, Emulsions, Cutback, etc., yet can also be used for cleaning, thawing, pile driving, heating buildings, winter concrete curing and strip mining.

COMPLETELY AUTOMATIC—there's no steam producing unit that heats as fast, is as safe and foolproof as the "Tankar" Steam Heater. It's automatic in feeding the water, stopping the burner, controlling the temperature and steam output and lighting the burner. The Littleford "Tankar" Steam Heater is small, compact, light weight and is mounted on Pneumatic Tired Wheels for fast trailing. Secure more information on this amazing steam producing unit from your nearest Littleford Distributor.

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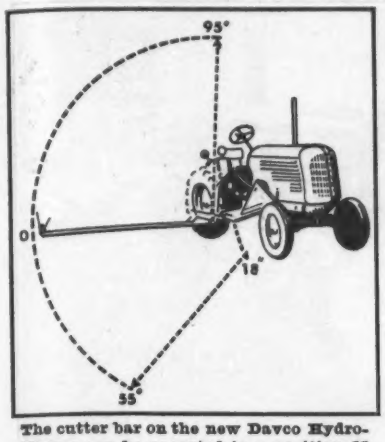

The cutter bar on the new Davco Hydro-Mower can be operated in a position 55 degrees below horizontal to 95 degrees above horizontal.

Heavy-Duty Mower Is All-Hydraulic

The Oliver Corp., 400 W. Madison St., Chicago 6, Ill., has developed a new Davco Hydro-Mower, an all-hydraulic heavy-duty unit for use with Oliver industrial wheel-type tractors.

The company states that this model uses a heavy-duty hydraulic pump capable of continuous operation and delivery of at least 15 gallons per minute at 800 pounds and 1,500 rpm. The pump operates the power hydraulic curb-and-bar lift which gives the mower a curb-lift minimum of 18 inches and a bar lift which makes it possible to operate the cutter bar in positions from 55 degrees below the horizontal to 95 degrees above. In addition, a hydraulic motor operates the cutter-bar unit—optional with 5 and 6-foot lengths—which has 3-inch underserrated sections and heavy-duty rock guards.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 128.

Block Catalog Available

The company's latest catalog, No. 49, has recently been released by the McKissick Products Corp., Box 2496, Tulsa, Okla. In this catalog, each classification of blocks has its own section. The types covered are traveling blocks, snatch blocks, construction blocks, tubing blocks, floor blocks, coring blocks, etc.

The complete catalog or any section may be obtained from the company, or by using the Request Card at page 16. Circle No. 125.

Perlite Institute Formed

Eighteen companies manufacturing perlite, a lightweight aggregate used in the building industry, recently formed a national trade association called the Perlite Institute, with offices at 35 W. 53rd St., New York 19, N. Y. A voluntary and unincorporated organization, it will render services to producers and to the trade.

The Board of Directors are: President T. C. Carter, Vice President of Great Lakes Carbon Corp.; Vice President J. D. Alexander, President of Alexite Division of Alexander Film Co.; O. L. Gregg, President of Gregg Lumber Co.; and C. H. Hall, President of Standard Perlite Corp.

The next meeting of the Institute is scheduled to be held in Colorado Springs on September 7-9.

Electric Plant Used For Firing of Fuses

The Ellins Construction Co. of Weston, Ontario, has recently found it economically sound in blasting operations to replace battery-firing of fuses with the use of a 3M21 Kohler electric plant. The company says that by using the plant it could fire five times the charge that had previously been handled by batteries.

The electric plant is secured to skids mounted on the back of a service truck and can easily be moved up to and away from the scene of the blasting. The plant operates independently and delivers electric power from its gasoline engine.

Further information may be secured from the Kohler Co., Kohler, Wis. Or use the Request Card at page 16. Circle No. 132.

The Ellins Construction Co. of Weston, Ontario, uses a 3M21 Kohler electric plant to fire blasting charges. The plant is secured to skids mounted on the back of a service truck that can be moved up to and away from the scene of the blasting.

BACK-RIP SCARIFIER

RIPS in your dead-head time when backing for new load.

BACK-RIPPING Saves Contractors TIME, MONEY and EQUIPMENT.

Hinged teeth assemblies mount on back of Bulldozer moldboards.

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Our Engineering Department will gladly help you select the right construction of Preformed "HERCULES" (Red-Strand) Wire Rope for your particular equipment.

. . . As a measure of value, nothing can take the place of PERFORMANCE . . . By the use of this accurate yardstick — year after year and under extremely severe working conditions of all kinds — Preformed "HERCULES" (Red Strand) has become recognized as "the Dependable Wire Rope for Any Tough Job". For over 60 years the "Red-Strand" has been a reliable guide to safe and economical wire rope service.

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WASHO Engineers Hold 28th Parley

Western Delegates Shoot Straight From Shoulder In Wide-Open Discussion Of Current Road Issues

✦ "THIS is a western meeting, gentlemen, so you can start shooting straight from the shoulder!"

That statement, by State Highway Engineer D. C. Greer of Texas, set off one of the most informative, spirited meetings the Western Association of State Highway Officials has had in its 28-year history. Approximately 225 western delegates with 80 ladies and guests were present as the WASHO conducted its 28th Annual Conference in Denver, June 13-16, at the Cosmopolitan Hotel.

Delegates from the 11 western states and Texas discussed current highway building issues, talked about better cooperation and joint action on various matters with the Associated General Contractors of America, and admitted among themselves that America's road-building enigma is far from solved.

Human Engineering Stressed

W. C. Lefebvre, President of WASHO and State Highway Engineer of Arizona, sounded the meeting's keynote when he said, "Gentlemen, part of the trouble is that our relations with highway users are not all they should be."

Discarding the usual generalization, Lefebvre got down to cases in specific language. Striking straight at the heart of the situation, he told how engineers could develop better relations with legislators, governors, highway commissioners, counties, cities, highway associations, the press, chambers of commerce, roadside merchants, the trucking industry, and contractors.

The governor of a state, Lefebvre said, is elected by popular vote in a land where the majority is sovereign. Many a state highway department, failing to bear this simple fact in mind, can get itself and the governor at odds with the people in the simple act of answering the governor's correspondence on highway problems. He pointed out that it never helps a state highway department to get crosswise with the state's governor.

Approximately 225 delegates plus guests were present at the 28th Annual Conference of the Western Association of State Highway Officials in Denver this past June.

Legislators, too, are men neither to be curried nor feared. Lefebvre declared that the biggest road problem a legislator faces is to get technical facts in simple language from the state highway department, so he can understand them and be guided accordingly. The WASHO President stressed the need above all else for furnishing state legislators truthful, clear, concise facts

(*Continued on next page*)

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ALL YEAR ROUND WITH
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EXHAUST PIPE COVERS

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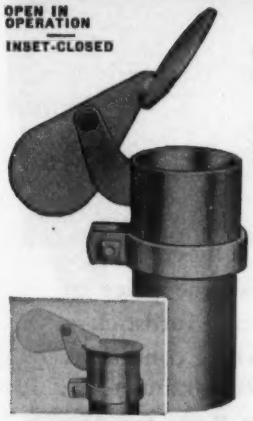

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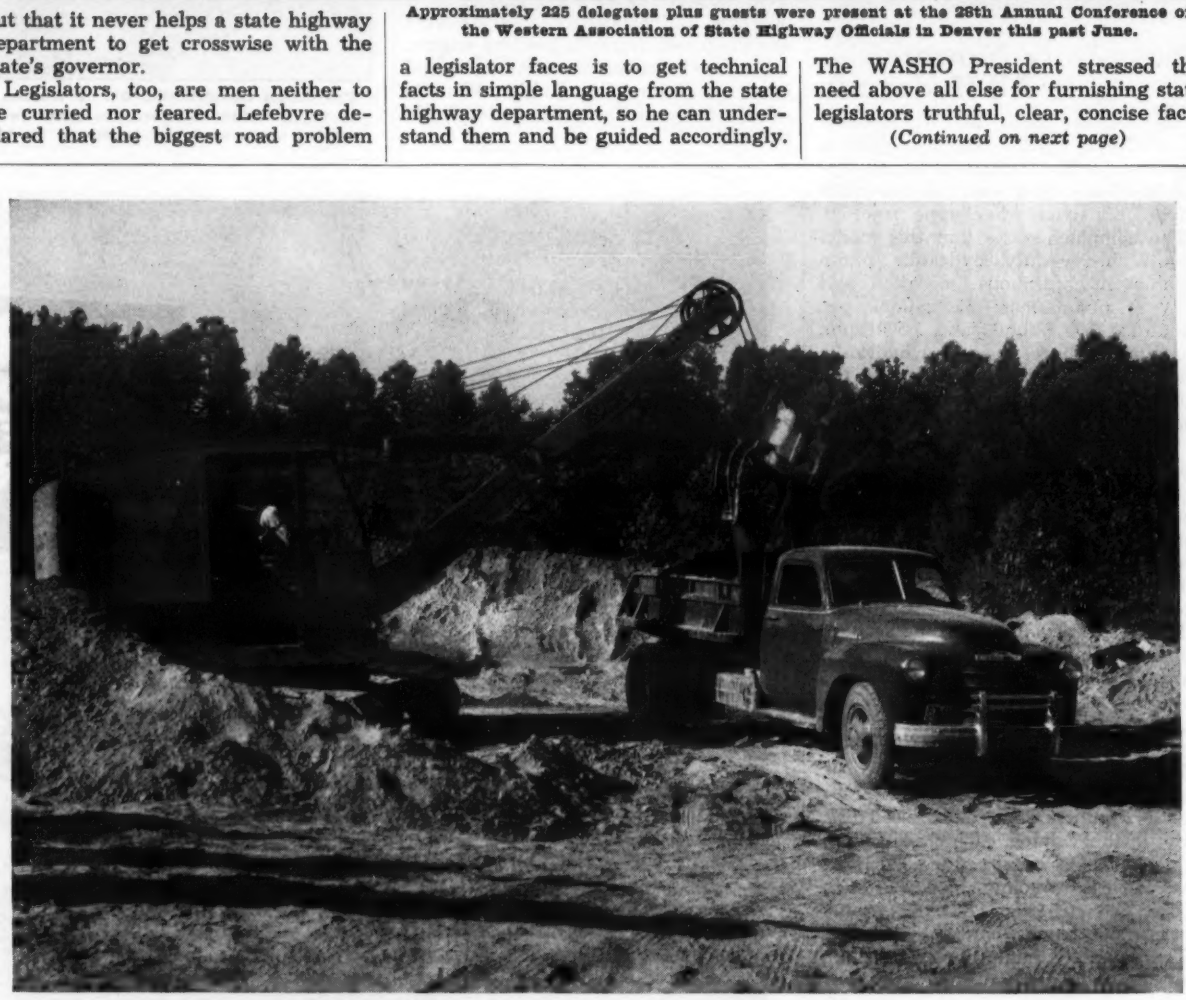

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CHEVROLET It takes a truck operator to really evaluate a truck. Yes, the man behind the wheel is the one who can best appreciate the worth of powerful yet economical performance . . . extraordinary load capacity . . . lasting quality, ruggedness and handling ease. He's the one who recognizes the advantages of new, improved features—of greater comfort and convenience for the driver. And these men in the drivers' seats—these experienced truck operators across America—know that Chevrolet trucks deliver more of the value factors they want. They know that Chevrolet trucks cost less to operate, less to maintain, and have the lowest list prices in the entire truck field. That's why they use more Chevrolet trucks than any other make! Your Chevrolet dealer will give you the facts in detail!

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TOP-VOLUME PRODUCTION BRINGS YOU TOP-VALUE FEATURES!

Chevrolet's new 4-SPEED SYNCHRO-MESH TRANSMISSION offers quicker, quieter and easier operation. Double clutching is eliminated because the gears are always in mesh. Faster shifting maintains speed and momentum on grades. Available in series 3800 and heavier duty models.

Chevrolet's power-packed VALVE-IN-HEAD ENGINES provide improved durability and efficiency as well as the world's greatest economy for their size!

Chevrolet trucks have the famous CAB THAT "BREATHES"*! Outside air is drawn in and used air forced out! Heated in cold weather.

Chevrolet Advance-Design brings you the FLEXI-MOUNTED CAB, cushioned on rubber against road shocks, torsion and vibration.

Chevrolet's exclusive SPLINED REAR AXLE HUB CONNECTION adds greater strength and durability to heavy-duty models.

Uniweld, All-Steel Cab Construction • Large, Durable, Fully-Adjustable Seat • All-Round Visibility with Rear-Corner Windows* • Heavier Springs • Super-Strength Frames • Full-Floating Hypoid Rear Axles in the 3600 Series and Heavier Duty Models • Double-Articulated Brake Shoe Linkage • Hydrovac Power Brakes in Series 5000 and 6000 Models • Multiple Color Options.

**Heating and ventilating system and rear-corner windows with de luxe equipment optional at extra cost.*

CHOOSE CHEVROLET TRUCKS FOR TRANSPORTATION UNLIMITED!

concerning the state highway system.

Calling attention to the fact that state highway officials deal frequently with highway commissioners, Lefebvre called for more courage and leadership in the formulation of policies and plans. "Don't be afraid to put new policies into effect immediately, on a trial basis if necessary," he urged. "And if these policies fail to prove up, don't be bull-headed about it; junk them just as fast."

The various government agencies with which highway officials work are composed primarily of human beings who respond to cases exactly like other human beings. No case, therefore, should be overstressed in a state's dealings with the PRA, the Corps of Engineers, or other Federal agencies with which they come in contact. It should always be borne in mind that the agencies have jobs to do, too.

Relations with counties and cities should be conducted on the same basis. Lefebvre warned the delegates to do business only with recognized, responsible officials. "I don't have to tell you what chaos results if you do otherwise," he said.

Relations with cities especially should recognize their plans and surveys. The state should never refuse to furnish whatever data it might have which would aid a city or county toward the solution of its problems. There is no place in contemporary highway affairs with cities or counties for anything but sound, honest, businesslike dealing on the part of state highway officials.

Admitting that the activities of various highway associations cause highway officials a great deal of misery, the former Naval Commander during World War II stressed his belief that human relations would work just as well with these people as anyone else. They, too, are human, he said. The highway associations represent business people who depend on highway traffic for their livelihood. Certainly there is nothing wrong or unethical with their desire to get more people to use the highways. It is their job, Lefebvre stated.

Press relations between the Colorado Highway Department and some of the local journals have become somewhat strained, and as this was noted by Mark U. Watrous, Colorado State Highway Engineer, Lefebvre commented on it in discussing better press relations.

"Not one single item is more important than good relations with the press," he declared. "The press is the only media for telling the public highway facts." Backing up that statement, in contrast to some other regional conferences of state highway officials, every meeting including the forum discussions was wide open, and the press was invited.

Chambers of commerce can be used to good advantage, as Arizona is proving. Arizona chambers of commerce have 14 member commissions to help educate smaller communities, sponsor better driving, and the like.

Present-day roadside merchants seem to be the worst problem, taken generally. From the state highway department's viewpoint roadside businesses are parasitic and serve only to impede the orderly flow of traffic. "The day must come soon when highway merchants must pay for their share of benefits they derive from highway building," the WASHO President recommended. "There is absolutely no fairness in their present demands that traffic be slowed down. Stern treatment, but fair treatment, is indicated for these people."

So far as relations with the trucking industry are concerned, Lefebvre urged a realistic view toward truck use of highways. The job of a state highway department is to keep legislators and the public informed of what loads highways will take; what they were designed for. A definite trend on the part of the trucking industry to violate weight limits has been uncovered in Arizona, with violations jumping from 18 to 21 per cent in one year. Law-enforcement agencies must be encouraged, and provided if necessary with scales. On the other hand, Lefebvre believes, highway departments should not tell legislatures how to apportion trucking fees.

Since contractors are working toward the same goal as are the various highway departments, the speaker was inclined to minimize their differences. All contractors should get impartial fair dealing. Lefebvre stated further that it would make for better relations if state highway engineers stressed results instead of methods, made more prompt payments, and did not permit themselves, through retained percentages on estimates, to be used as collection agencies.

Concluding his annual President's address, Lefebvre said that expansion of today's highway mileage and the diversion of highway funds were the two greatest dangers to road building in 1949.

"Any state has only one highway system," he said. "Any state has only one criterion: 'Who's to pay for what?' So all our efforts must go to one highway system."

Dr. Hewes Speaks

Dr. L. I. Hewes, Chief of Western Headquarters of the Public Roads Administration, called for new thinking and action in dealing with contemporary transportation. In a paper titled

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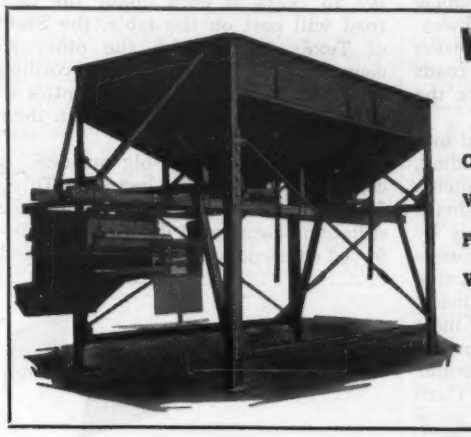

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Complete—with scale for two or three aggregates.

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For use on culvert—bridge—curbing—foundation jobs.

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HERE is the fast, smooth operating MultiFoote Duomix 34-E. Simplicity of design and the double cone drum mean easy upkeep. The high operating platform, no-pressure water system, fast operating skip and discharge, assure getting the mix on the road quickly. Ask for the new Duomix Catalog.

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THREE SIZES
27-E Singlemix (Single drum)
34-E Singlemix (Single drum)
34-E Duomix (Double drum)

WASHO Engineers Holds 28th Parley

(*Continued from preceding page*)

"What Highway Transportation Now Reveals", Dr. Hewes urged a shift in emphasis in costs, recommending that costs should now be based on vehicle miles and/or ton miles on a highway. To prove his point, the PRA division chief cited statistics to show that roads which carry the most traffic have the lowest vehicle-mile cost.

Frankly plunging straight ahead into the "No Man's Land" of road building, Hewes declared flatly that statements by Commissioner of Public Roads Thomas H. MacDonald and a study by the California Division of Highways proved that the greatest destructive factor on our highways is heavy loads. Trucks, said Hewes, are the most destructive thing on the highways today, and logging trucks in particular are a constant overload offender. Until trucks can be made to pay a more realistic share of the highway bill, road-building problems will continue to arise.

The current highway building and maintenance picture can best be visualized, Dr. Hewes said, by a collision between private ownership and private enterprise on the one hand, and public service on the other. Motel and restaurant owners are grouping together more and more to resist findings of state highway departments. They bring pressure to bear to further their own ends at the expense of the traveling public.

But the high point of Dr. Hewes' address was his flat assertion that the current pressure for toll roads reflected "an inadequacy of our highways". Not content to merely be against toll roads, Dr. Hewes pointed out that highway engineers generally must provide an alternate solution. That solution, Hewes believes, is for the states to augment current financing by borrowing money on highway bonds; by financing and building for the future in a manner such as the general public has never seen. Only by so doing, he said, could free roads be built fast enough to combat the evil of false economy of toll highways.

Panel Discussions Held

For the first time since its inception, the Western Association split its delegates into small groups at several meetings. This was done to give people interested in bridges, administration, maintenance, construction, design, materials, planning, and right-of-way acquisition a chance to rip their respective subjects open and discuss the most important points of each.

The subject of administration, becoming more important with each passing year, was reviewed by a panel composed of D. C. Greer of Texas, W. T. Holcomb of Nevada, and Roy W. McLeese of Utah, all Chief Engineers. McLeese pointed out that the administration of secondary roads is today's biggest administrative problem; in fact, they are more an administrative than an engineering headache.

Farmers served by secondary highways must pay their share for these roads, McLeese warned. States and the PRA should iron out vast differences in design, and qualified engineers must be hired at county levels to assure the best back-country road program. Land-use studies in connection with secondary roads should be given high priority, McLeese said.

The best definition of a farm-to-market road at the conference was given by Greer, who defined a farm-to-market road as "one that hasn't been built". Greer called for a more realistic approach toward the tax situation, saying that taxes should be administered more nearly at the level where they originate.

Texas has recently started with counties a "75-25 deal" for farm-to-market construction. This plan yielded $14,500,000 last year. Suppose a county is in a hurry to build some certain job, but the state can't get to it because other secondary roads honestly rate a higher construction priority due to the people they serve. If this county will lay 75 cents of each dollar the new road will cost on the table, the State of Texas will furnish the other 25 cents. The plan works nicely, according to Greer. It is helping the counties to get good roads and still maintain their independence.

Maintenance is now big business. It cost over $1,000,000,000 last year. Three factors enter into the maintenance situation: permanent deterioration, deferred construction during the war, and a constant increase in vehicle miles. W. E. Sutton, Wyoming Maintenance Engineer, reviewed briefly the growth of bituminous highways in his state. Back about 1928 Wyoming built nearly 500 miles of bituminous surface a year, but today's heavier traffic loads cause many of these older roads to fail, largely due to inferior bases. More attention should be given to adequate base construction on bituminous roads, Sutton believes.

Col. V. J. Brown of *Caminos y Calles* suggested that acid-treated lime and aniline perferol might solve some base problems in the United States as well as they have done in Argentina and other South American countries. Clarence Stahl, Montana's new Chief Engineer, reported that his research laboratory is currently testing lime additives for base work, and may soon have some conclusive results.

Last winter's snow was the worst many a western state has ever seen, but winter damage was generally light because subgrades were dry before the snow began to fall. Snow-removal costs skyrocketed, however. Nevada, which ordinarily spends $85,400 a year for this item, spent $354,000 in 1948-49. Wyoming spent $618,000 for snow removal, against a normal expenditure of $235,000. Routine snow-removal work was especially complicated by rescue and mercy missions, by bad road information, and big trucks not equipped for winter travel. One Colorado radio station saturated the air for days with a

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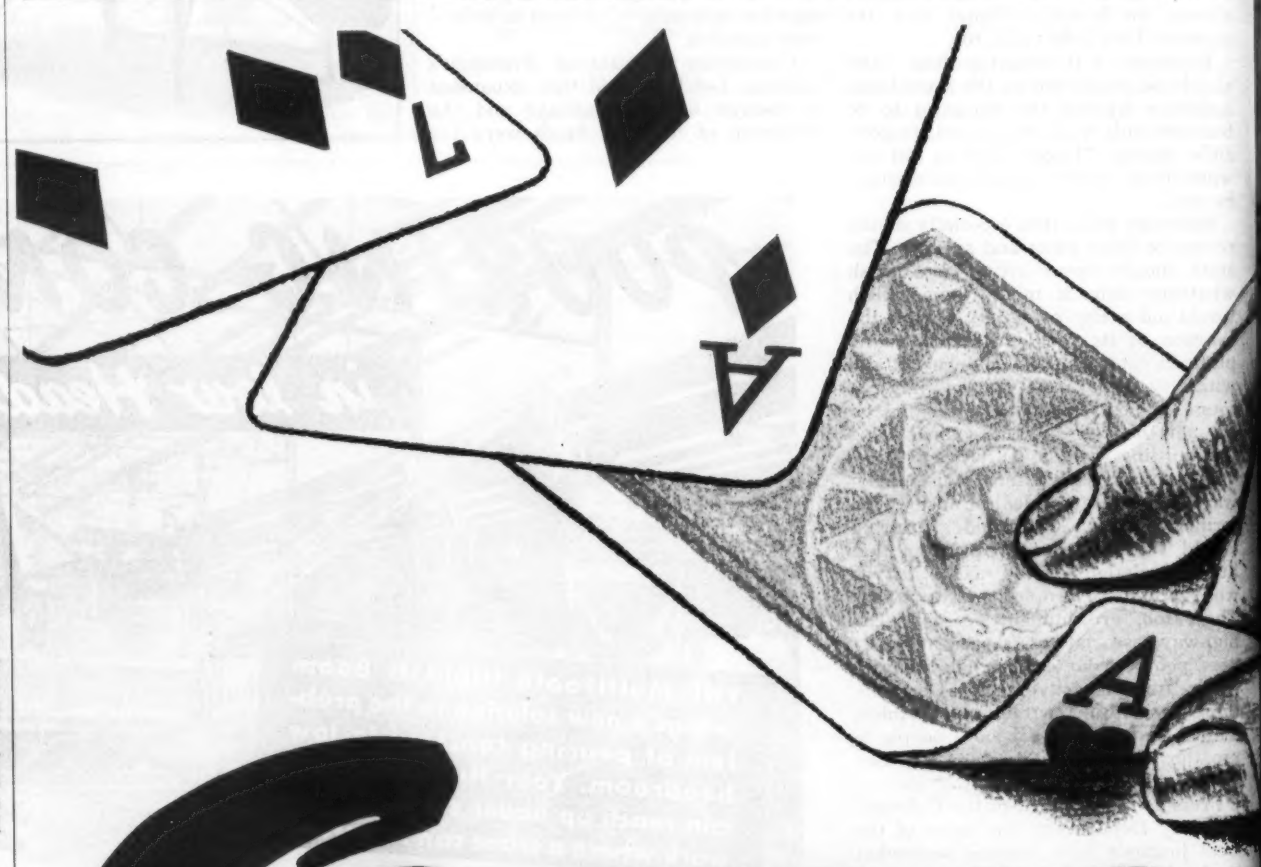

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report that all Wyoming highways were open and Colorado's transcontinental routes were closed. The exact opposite was true. Driven by hard winds, snow piled on Wyoming highways in drifts 12 feet deep and up to 1½ miles long. Radio-sponsored traffic helped the snow-removal work none at all.

Construction Practices Told

Sheepsfoot rollers, embankment construction, densities, air-entrained concrete, and other construction aspects were discussed in a meeting of construction engineers. More and more emphasis now is placed on high densities in subgrades, and the economics of too-high densities came up for serious discussion. The consensus of opinion indicated that the modified AASHO method of sampling soil density was preferable to the old standard method, but that highway engineers might be wise and more realistic if they asked for 90 per cent densities—and got them—than to pay for 95 per cent and get sporadic results.

The advantages of air-entrained concrete were discussed, and later on Clarence Stahl, Montana's new State Highway Engineer, gave a talk on the importance of eliminating surface cracks in concrete. When the question was asked, "How do you prevent the greater frequency of air bubbles or bug holes in the surface of air-entrained concrete?", none of the engineers present had found a satisfactory solution.

Perhaps one of the most significant conclusions reached in both the construction and bridge meetings was that of reducing to a minimum the amount of hand rubbing on bridge concrete. Here again, it was the consensus of opinion that the natural concrete surface remained more beautiful than rubbed concrete, over the years.

Highway Trends

Carl W. Brown, Chief Engineer of the Missouri Highway Department and President of the AASHO, reported to the assembled delegation the latest in highway trends. Perhaps the most significant of these trends has taken place within the past six months. In that time 6 states have passed or authorized construction of toll roads. Motor-fuel taxes have been increased in 16 states, while 7 states have defeated this kind of legislation and 10 more states have such legislation pending.

The increasing traffic flow on the nation's highways continues to be the highway engineer's biggest aggravation, but the only way the engineer can cope with the problem, according to Brown, is "to take the initiative".

"The time has come when we must prevent special interests from stampeding our legislators," Brown said.

California's experience in handling heavy traffic flow was told in a speech by A. M. Nash, Design Engineer of the California Division of Highways. Emphasis was placed on the design and construction of channelized intersections to carry traffic through merging or crossing streets.

A. N. Carter, Manager of the Highway Division of the Associated General Contractors of America, recapitulated the problems as well as the accomplishments of the AGC and the AASHO, during the past year. Carter said the magnitude of the road-building job ahead is staggering, and the most effective way to get at it is to prepare long-range plans with specific yearly programs outlined.

Consultants can help in the preparation of plans, he suggested, and in the meantime the AGC is working through engineering schools to interest more young engineers in the field of highway building.

Calling for the use of all highway funds on roads, Carter told the delegates that the diversion of funds in recent years had been sufficient to build nearly 100,000 miles of new highways. Actual construction, he said, is still a big challenge. He called for good plans, clear specifications, and more freedom on the part of contractors to choose equipment and designate the methods to be used.

Contractors want the per cent of retained money from their pay estimates reduced. This could be done, he said, by retaining the usual 10 per cent until the job was half finished; then paying estimates in full. In effect, that would make a 5 per cent retention for the whole job.

Construction can be speeded, Carter said, if the various agencies will permit the contractor free use of new types of equipment. Agencies should be sure land is available and the job is ready for the contractor to move in and start work, once bids are opened. Costs can be reduced if local materials are used to a maximum, and the same results will be achieved if hand labor is cut to a minimum. He urged better awarding programs, better design standardization, lettings early in the year, and a better balanced construction program.

Resolutions

Resolutions, aside from the traditional one of appreciation, were held to a minimum. One resolution called on Congress to appropriate funds for forest roads on the basis of its 1948 authorization, when $25,000,000 was granted. A second resolution called for a recommendation to the AASHO to increase funds for highway systems, and thus to accelerate the programs generally.

Holcomb New President

W. T. "Billy" Holcomb, Nevada's "mighty midget" State Highway Engineer, succeeds Lefebvre as President of the western organization. Serving with him will be D. C. Greer of Texas, Vice-President; and A. M. Nash of California, Secretary and Treasurer.

The Executive Committee will be made up of three men: W. J. Dineen of Wyoming, Ray Dinsmore of Washington, and Mark Watrous of Colorado.

Delegates left Denver unanimous in their opinion that the 28th Annual Conference, under the General Chairmanship of D. N. Stewart of the Colorado Highway Department, had reached a new peak of efficiency for the friendly exchange of information.

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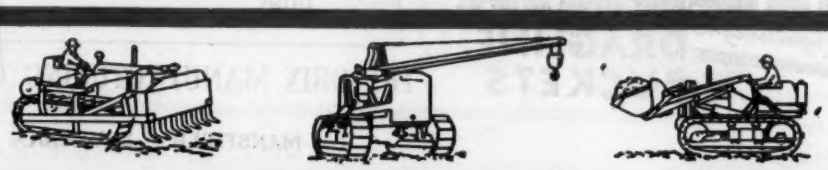
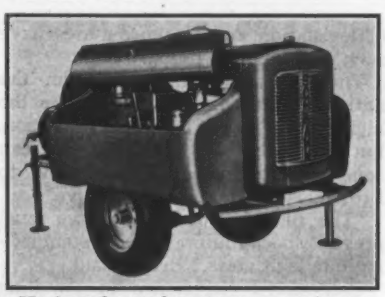




Most engine and compressor parts are interchangeable on the new Schramm Model 105 Unistage compressor.

Compressor, Engine; Parts Interchange

A new Model 105 Unistage compressor has recently been presented by Schramm, Inc., West Chester, Pa. One of the principal features of this unit is the fact that the 4-cylinder air compressor and the 4-cylinder Schramm engine which operates it complement one another. The company claims that 90 per cent of the engine parts are interchangeable with corresponding parts of the compressor—a feature which reduces to a minimum the carrying of service parts. With an air delivery of 105 cubic feet, this unit is also equipped with the Schramm Pneumastat to assure infinitely variable speeds and the elimination of continuous loading and unloading.

Further information may be secured from the company, or by using the Request Card at page 16. Circle No. 86.

Castings Repaired By a Fusion Process

A fusion process for repairing cast-iron and aluminum castings has been developed by the Guth Welding Works, McPherson, Kans. The Guth process is designed to avoid crystallization and internal stresses during repair operations. It is recommended by the company for use on cracked engine heads, blocks, water jackets, heavy diesel heads, mud pumps, water-cooled manifolds, industrial castings, and similar applications.

According to Guth, each casting sent for repair is given individual attention and study, with particular stress placed on the causes of the break, the molecular structure of the casting, and how best to repair it. High tensile and compressive strengths, and high resistance to heat and impact are provided by the process, Guth says. The repair area is finished off to close tolerances, and no discernible repair marks are left visible.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 93.

Land-Clearing Equipment

A catalog on the Fleco stumper, root rakes, and rock rakes has been recently released by the Florida Land Clearing Equipment Co. of Jacksonville, Fla. It is a 12-page fully illustrated report on the Fleco equipment in use. The bulletin suggests using the detachable stumper for stumping and tree-dozing and then the root rake for raking and piling. It states that the stumper can be mounted or detached in 5 to 15 minutes.

The detachable stumper, the folder points out, will not cut the tree at the ground surface but will penetrate the ground to approximately 24 inches, cutting a path 30 to 36 inches wide. Photographs demonstrate the detaching of the stumper and replacement with a root rake. The Fleco root-rake shoe is an attachment which can be mounted on the root-rake tooth for use where willows and other small brush are encountered.

A number of photographs show the rock rake in operation on riprap placement and boulder clearing. The catalog also mentions that wearing caps, which may be replaced at low cost, are available for use with the rock rake. This cap slips over the point of the tooth and is bolted onto the rib in the back.

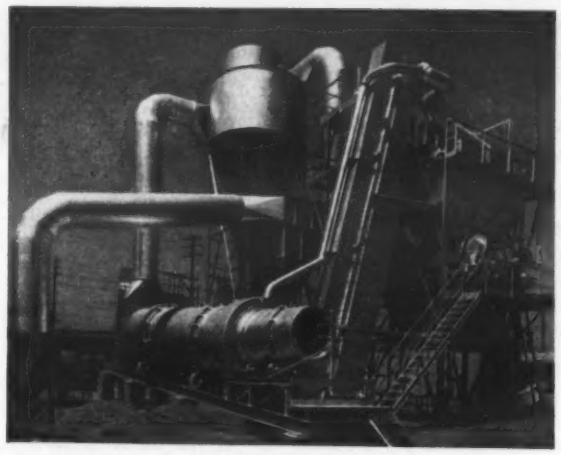
This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 82.

Stud Welding Demonstrated

A series of demonstrations are now being given in the major 40 cities of the United States by Nelson Stud Welding Division of Morton Gregory Corp., Lorain, Ohio. Their purpose is to acquaint architects, engineers, and contractors with the company's method of applying roofing and siding materials with the Nelson stud welder.

The demonstrations include luncheons and a chance for all those attending to try operating the stud gun themselves.

Literature on the Nelson stud-welding method is available from the company. Or use the Request Card at page 16. Circle No. 131.



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Pavilion Constructed At Seashore Resort

Steel, Concrete, and Tile Structure Replaces Wood Building Razed by Fire At Myrtle Beach, S. C.

(*Photo on page* 1)

✦ THIS year's visitors to Myrtle Beach, S. C., a year-round resort on the Atlantic coast, will discover that something new has been added to the ocean front since 1948. Over the winter the Myrtle Beach Farms Co. constructed a modern pavilion, 147½ feet long x 85 feet wide, to replace the wooden structure that was destroyed by fire in December, 1945. The new building, built at a cost of around $350,000 by the Moore Construction Co. of Myrtle Beach, S. C., contains two stories and a balcony. The foundation, floor slabs, and columns are of reinforced concrete; steel trusses support the roof; while the walls are chiefly tile. Work on the pavilion got under way in November, 1948. A mild winter, during which only four working days were lost due to bad weather, permitted the completion of the building by June in time for the summer season.

Government restrictions and material shortages due to the war delayed the replacement of the wooden pavilion after the disastrous fire. The former structure had long been a landmark on Myrtle Beach. Constructed in 1914, the building had been re-modeled in 1922 and again in 1938, and its destruction left something missing at the beach resort. But in March, 1948, construction began on new concrete and tile bath houses, and these were completed in time for last year's bathing season. Built on the old site and with accommodations for 1,000 bathers, the bath houses adjoin the new pavilion on the south, connected to it by an arcade and deck. The Moore Construction Co. also erected the bath houses.

Concrete Foundation

The foundation for the new pavilion consists of 150 reinforced-concrete spread footings and a reinforced-concrete retaining wall to enclose the structure. The greater number of footings are 30 inches square x 12 inches deep, on which are founded the circular columns supporting the second-floor slab. The remainder of the footings, chiefly around the sides of the building, are larger, measuring 11 x 12 feet with a depth of 22 inches. The excavation for the smaller footings was done by hand, while a ⅜-yard dragline dug the holes for the larger footings and the retaining wall. The wall is from 8 to 16 inches thick, and varies in depth from 2 to 12 feet. Along the ocean side the wall has the greatest depth, decreasing in steps towards the street end.

No trouble was experienced with water from the ocean during the work on the foundation. The ocean side of the pavilion is back 60 feet from the high-tide line, and the elevation of the first floor is 20 feet 6 inches above sea level or mean low water. Tides along the South Carolina coast average 6 feet. Any water that did collect in the excavation holes was drained back into the ocean through a ditch that was opened up by the dragline. A feature

(*Continued on next page*)

Myrtle Beach Farm Co. Photo
This is a model of the new pavilion and bath house built at Myrtle Beach, S.C., year-round resort on the Atlantic coast.

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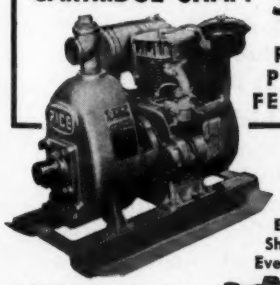

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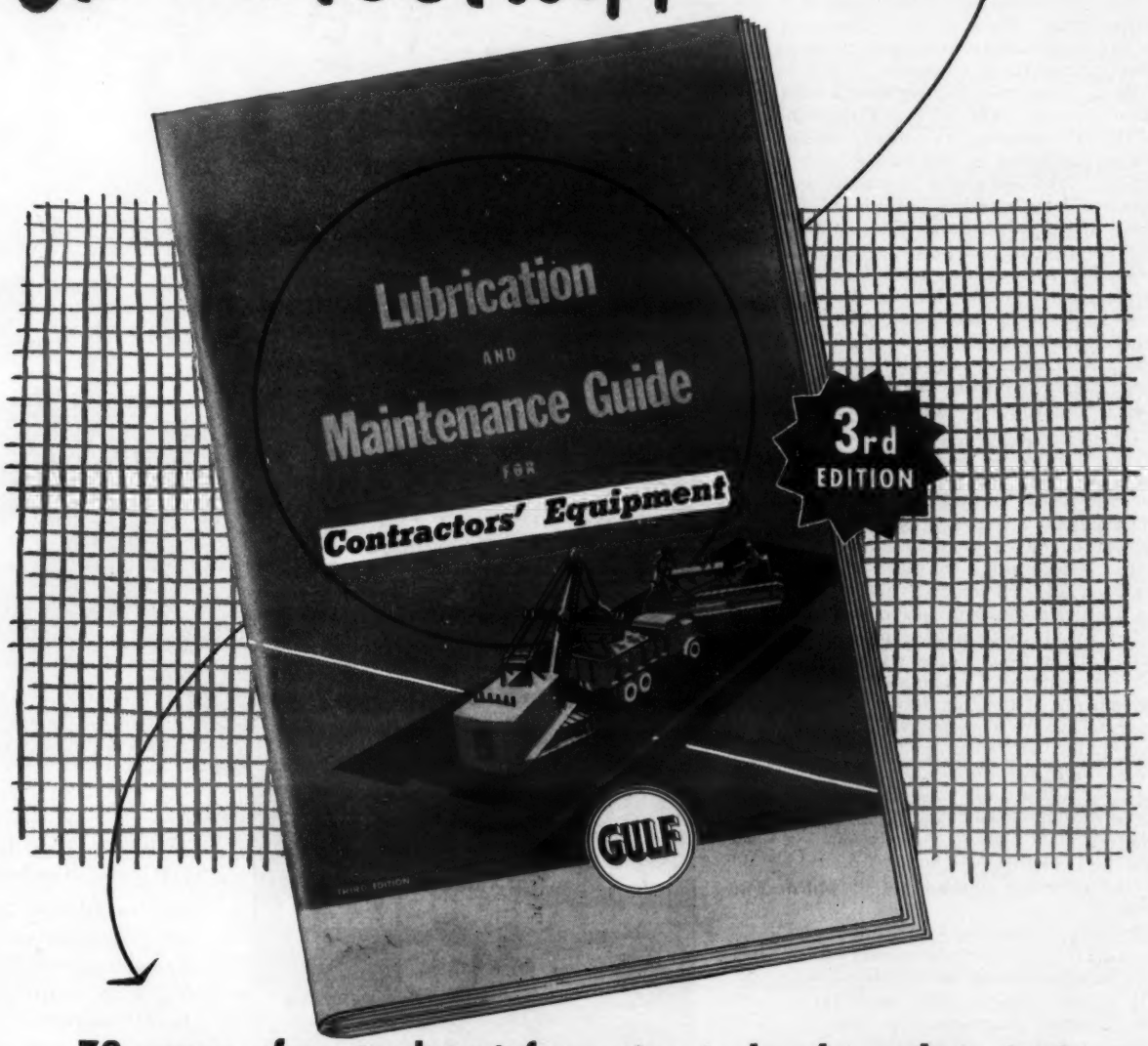

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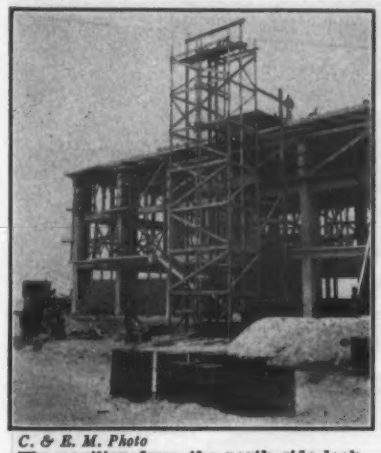

C. & E. M. Photo
The pavilion from the north side looking towards the ocean. Notice the timber hoist tower and the Rex 2-bag concrete mixer at the left.

Pavilion Constructed At Seashore Resort

(Continued from preceding page)

of the foundation retaining wall was its enclosure of a trench running around the sides of the building. This 2-foot-wide x 3-foot-deep trench contains all the utilities for the pavilion such as water and sewer mains, light, gas, and power lines. Thus the first floor can be partitioned about as desired, without affecting the utility services.

Reinforcing steel was supplied by the Kline Iron & Metal Co. of Columbia, S. C. All concrete was mixed at the site in two 2-bag mixers—a Rex and a Smith. Sand and gravel aggregate was obtained from pits in Lilesville, N. C., about 150 miles distant. The material was shipped by rail via the Atlantic Coast Line, and hauled from the siding to the job in trucks. Part of the sand was supplied from local sand pits. Bag cement was furnished by the Volunteer Portland Cement Co. of Knoxville, Tenn., while the water for the mix was tapped from the city hydrants.

Form Work

For the retaining walls, 1-inch lumber was used in building the forms, while 2-inch stock was employed for the large square or rectangular columns. The backing consisted of 2 x 4 studs on 16-inch centers, and double 2 x 4 wales varying in spacing from 15 inches at the bottom of a pour to 30 inches at the top. Universal form ties held the side walls together. During the pouring of the foundation, the two concrete mixers were moved about the site. Later, when the upper portion of the pavilion was constructed, the mixing plant was set up at the north side of the site. The lower floor is a 5-inch concrete slab poured directly on the sand fill. The second floor, supported by the concrete columns, is 6 inches thick.

The larger columns, 22 in number and located around the sides, measure 19½ x 44 inches generally, with a few being 19½ inches square. The majority of the columns, supported on the remainder of those 150 footings, are 12 inches in diameter. Forms for these columns consisted of paper-fiber tubes cut to the required 10-foot lengths. These paper tubes or cylinders, ¼ inch thick, were supplied by the Sonoco Products Co. of Hartsville, S. C., and despite their light weight, making them easy to handle, were of ample strength. As the concrete was placed, it was vibrated with Mall vibrators with no effect on the paper forms. According to the contractor, the 28-cent-a-foot cost of these 12-inch-diameter tubes was considerably less than what it would cost to build the conventional wooden circular column forms.

No exterior bracing was needed to support these paper forms. At the bottom they were enclosed in a square built of 2 x 4's which was filled with sand to retain any grout that might seep out from underneath. The tubes were constructed in a spiral design, and after the concrete had sufficiently hardened, the paper was simply peeled off and discarded. According to reports, columns as high as 30 feet have been poured with such tube forms, but on this job the maximum column height was 10 feet. Water was used in curing the concrete.

Auditorium

The lower floor of the pavilion will be given over to various concessions—games, refreshments, recreational areas, etc.—while the second floor will contain the auditorium. In pouring this second-floor slab, 4 x 4 uprights or T-posts were erected over the main floor on 4-foot centers both ways. They supported beams consisting of two 2 x 8's spiked together, over which were laid 2 x 8 joists on 16-inch centers. On top of this framework ⅝-inch plywood panels were spread out to hold the concrete. Form cutting was speeded with the use of a Delta table saw, a DeWalt radial saw, together with SkilSaw and Speedmatic hand saws.

For these higher pours a 50-foot timber tower was erected at the north side of the building and equipped with a hoist driven by a Century 5-hp electric motor. The tower had a double platform, one counter-balancing the other, so that as one side was going up the other side was coming down. On the ground the mixed concrete was discharged into buggies or wheelbarrows which were raised to the desired level, while an empty was being lowered at the same time. The full buggies were

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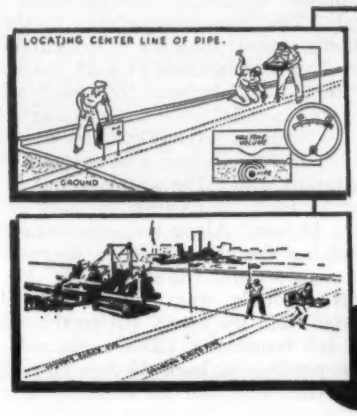

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C. & E. M. Photo
These two 12-inch-diameter columns support the deck between the bath houses and the pavilion. The paper form is still on the column at the left.

wheeled off and emptied into the forms.

Before the concrete had fully set up on the second-floor slab, Bull Dog clips were embedded in the surface to which creosoted nailing strips were later secured. Mastic was spread between these nailing strips or sleepers to deaden the sound from the floor which was then placed. The floor is 1¼-inch tongue-and-groove hard maple, with the tongue-and-grove placed close to the bottom of the stock so that the floor may receive many sandings.

At the east or ocean end of the building is a stage, while at the west or street end is a stadium-type balcony rising up from the floor of the auditorium. The balcony is also built of reinforced concrete. For stage shows the hall can accommodate about 1,700 people. It will be equipped with movable seats that can be pushed out of the way for dances.

Steel Roof Trusses

The concrete columns on the lower floor which support the second-floor slab do not interfere with the function of the pavilion since the first floor will be partitioned off into concessions. No inside columns obstruct the full sweep of the auditorium on the second floor. The roof is supported by ten steel trusses which span the width of the building, and rest on the large outside concrete columns. The original design of the pavilion called for a poured-concrete roof with ribs projecting above the arch, but this was revised to steel trusses.

The trusses were supplied by the Kline Iron & Metal Co. The welded trusses were delivered to the job in two pieces, with a field connection at the center which was bolted together on the job. The trusses had an overall length of 82 feet, and each weighed 4,400 pounds. A dragline with a 36-foot boom unloaded the trusses from the delivering truck and set down them down on the first floor. After assembly they were raised by a mast and hand hoist to the top of the 44-inch concrete columns. The top or bow of the trusses is 50½ feet above the first-floor level.

The roof is of wood, consisting of 2 x 8 joists covered with 1-inch sheathing. On top is a 20-year bonded asbestos felt roofing material. Copper gutters and downspouts are located at the eaves. The second-floor auditorium is reached by inside stairs at the west end of the building under the rear of the balcony. On each side there is also a set of concrete stairs to serve as a fire escape.

The walls are built of National Fireproofing glazed tile, 8 inches thick, while the inside partitions are of the same material but only 4 inches thick. For fitting, the tile was cut with a Clipper masonry saw which employed Clipper Superior blades. For drilling holes in the concrete a Thor electric drill was employed.

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(*Concluded on next page*)

C. & E. M. Photo
Carpenters work on column forms on the second or auditorium floor of the pavilion. In the foreground wooden forms are being constructed for the balcony pour.

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IT TAKES a tire that's tougher than rock for quarrying, strip mining, and other severe operations, a tire that will take hold and GO . . . with heaping loads, right over the most treacherous terrain. The ONE tire that will do just that, day in and day out, is the Firestone Rock Grip.

Its thick, tough, "elephant-hide" tread is extremely resistant to cuts and snags. Those rugged power bars in the tread deliver plenty of traction, provide quiet rolling on pavement. The bodies of these tires are fortified to stand up, even under the most unmerciful beating. Their extra-strong, low-stretch, Gum-Dipped rayon cords prevent tire growth and preserve body strength for extra retreading.

Firestone Rock Grips will shorten your downtime, increase your yardage, and broaden your margin of profit.

Listen to the Voice of Firestone every Monday evening over NBC

Copyright, 1949, The Firestone Tire & Rubber Co.

When you buy replacement tires or new equipment SPECIFY—
Firestone Off-the-Highway TIRES

C. & E. M. Photo
The northeast corner of the pavilion, showing a concrete corner column—also the tile wall and part of the roof truss.

Pavilion Constructed At Seashore Resort

(Continued from preceding page)

pipe railing was called for in the construction of the pavilion. This work was done by the Gray Welding Co. of Myrtle Beach. The posts and top rails are 2-inch ID, while the lower rail is 1½-inch ID.

The steel window sashes in the pavilion were supplied by Ceco Steel Products Corp.

Personnel

The Myrtle Beach Farms Co., owner of the new pavilion, is an old and well established South Carolina company that originally engaged in naval-stores operations in the Low Country. When the turpentine industry moved farther south to Georgia and Florida, the company engaged in cypress logging over its swamp holdings. It also developed in one particular area, less than half a mile from the ocean, a fertile farming site from a swamp filled with muck that had almost reached the peat stage. These farms possess some of the richest soil in the south. With this new pavilion, the versatile company will augment the recreational and entertainment facilities of the resort area. The building is also well suited for conventions. In the lot across the street, rides and concessions will be set up.

The original plans for the Myrtle Beach pavilion were drawn by Raymond & Rado, New York City architects. The design was revised by J. E. Cooney, a Myrtle Beach, S. C., architect, who also supervised the construction.

A force of 50 men was employed on the project by the Moore Construction Co. under the direction of Jeff Moore, President of the contracting firm. L. B. Brooks was General Foreman.

J. E. Bryan, Jr., Secretary-Treasurer of the Myrtle Beach Farms Co., represented the owner on the construction of the new beach facility.

Breaker and Rock Drill

Two releases, one on a breaker and the other on a rock drill, are available from Warsop Power Tools, Inc., 347 N. Twelfth St., Philadelphia 7, Pa. The literature on the Warsop portable self-contained breaker explains that it derives its power from a two-stroke internal-combustion engine using a mixture of a half pint of oil to one gallon of gasoline. It tells how the tool, which weighs approximately 90 pounds, may be used for breaking concrete, general demolition work, trench spading, asphalt cutting, light ramming, and digging hard and frozen ground. It notes as a feature of the Warsop breaker the fact that the hammer piston is returned to the striking position by means of by-passed gases, without requiring the aid of springs.

The second release describes the Warsop rock drill, a one-man tool which is also self-contained and does not require the use of compressors. Its fuel requirements are the same as the breakers. The release points out that the drill may be operated in any position from the vertical to the horizontal; that it takes standard-size drill steel; and that drill rods for detachable bits are available.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 31.

C. R. Jahn Company Moves

The sales and general executive offices of the C. R. Jahn Co., formerly located at 1106 W. 35th St., Chicago, have been moved to 212 Main St., Savanna, Ill. The Jahn factory has been located in Savanna for several years, manufacturing a complete line of heavy-duty low-bed trailers.

Exceeds all state safety specifications

TUTHILL HYWAY GUARD

cuts traffic accidents!

Write for technical brochure today!

Super-strong Hyway Guards safely deflect cars and cushion shock to vehicle, occupants and rail. Easily seen by day or night. Speedy, permanent erection with little or no maintenance required.

TUTHILL SPRING CO.
760 W. Polk Street, Chicago 7, Illinois

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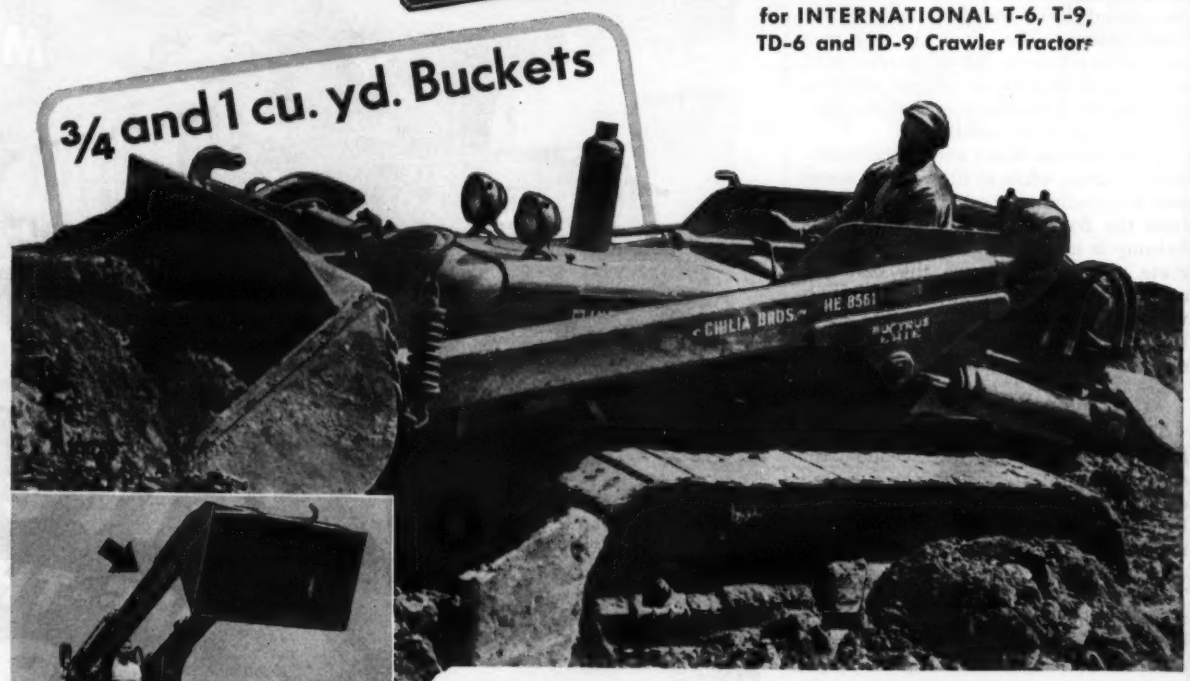
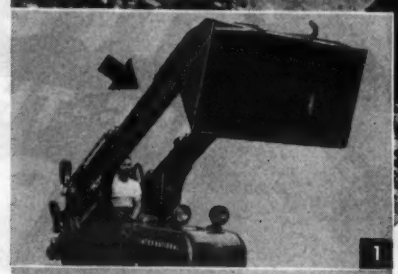
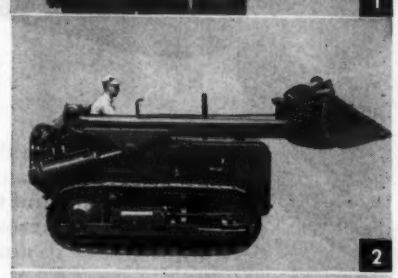
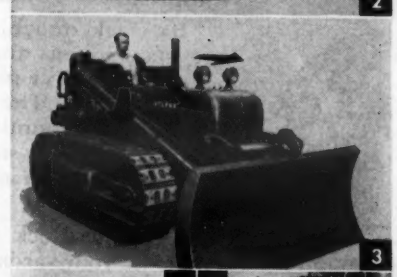
THE NEW BUCYRUS ERIE DOZER-SHOVEL

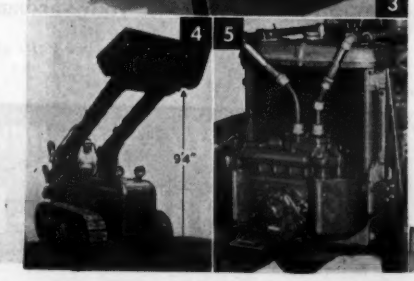
for INTERNATIONAL T-6, T-9, TD-6 and TD-9 Crawler Tractors











Now, more than ever, it pays to do your digging, loading, stockpiling, bulldozing and lift-about jobs the Dozer-Shovel way! The new Bucyrus-Erie Dozer-Shovel gives you all the advantages of its pace-setting predecessor plus greater speed, greater simplicity, easier operation and a long list of significant new features thoroughly tested and proved in the field. The new Dozer-Shovel is available with either gravity-dump bucket or hydraulic bucket control for more digging ability, bigger loads, controlled dumping. Looking for fast, economical, high-output performance? Ask about the new Dozer-Shovel!

1. HYDRAULIC BUCKET CONTROL available with new Dozer-Shovel means big payloads, fast or slow dumps at will.

2. LOWER OVERHEAD CLEARANCE and no superstructures enable Dozer-Shovel to work in close quarters.

3. FULL VISIBILITY— Operator has 360°, unobstructed vision in all directions.

4. HIGHER LIFT for easier spotting and loading to trucks.

5. IMPROVED HYDRAULIC CONTROL with pump, valve and tanks combined in one compact unit.

BUCYRUS · ERIE COMPANY
SOUTH MILWAUKEE, WISCONSIN 183T49

See Your INTERNATIONAL Industrial Tractor Distributor

This OTC No. CT-683 valve-spring compressor was developed in cooperation with Caterpillar service engineers.

Compressor for "Cat" Engine Valve Springs

A new valve-spring compressor for Caterpillar engines has been announced by the Owatonna Tool Co., 348 Cedar St., Owatonna, Minn. The OTC No. CT-683 is said to operate successfully on all Caterpillar diesel engines. It includes a double-end adapter which fits two sizes of cylinder studs. There is adequate leverage to compress these valve springs safely and easily, says Owatonna. The yoke and handle are drop-forged and heat-treated.

Further information may be secured from the company. Or use the Request Card which is inserted at page 16. Circle No. 14.

Pressure-Treated Wood

A bulletin on a pressure-treatment method to make wood resistant to fire, termites, and decay has been prepared by the Protexol Corp., 71 Market St., Kenilworth 3, N. J. The folder gives general information concerning the nature of the treatment, its effect on structural wood, its permanence, and its cost. The four classes of treatment are explained and their suggested applications and specifications are given. They are listed as: Class A, the non-combustible treatment; Class B, slow-burning treatment; Class C, non-flammable treatment; and Class D, Pyresote treatment, designed primarily for structural timbers used in places in which protection against fire, decay, and insects is a very important consideration.

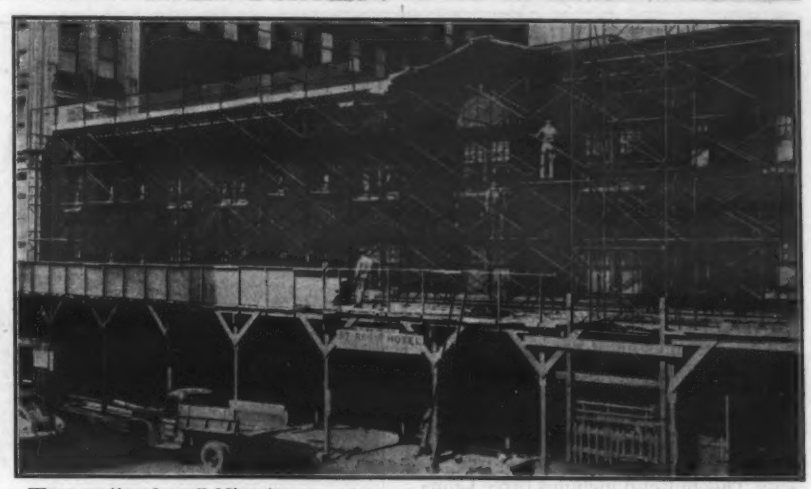
Also issued by the company is the "Protexol Mews," Circular 111, which describes with pictures and words the protection offered by fire-retardant plywood. Methods of treatment, properties, and stock-list sizes of the fire-retardant plywood are also given.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 46.

Sectional Scaffold Has Locking Device

A new tubular type of sectional scaffolding, including rolling towers, has been recently offered by Wilson-Albrecht Co., Inc., 3565 Wooddale Ave., Minneapolis 16, Minn. This scaffolding adheres to the established principles of sectional scaffolding, but incorporates some new features. Among them is the Waco locking device designed to eliminate wing nuts and threaded bolts, and save time in assembling and dismantling the scaffolds. Also, connector pins are riveted to each frame to prevent loss, and ladders are welded to each frame for safety.

The manufacturer states that the Waco units are interchangeable with other makes of sectional scaffolding. They are made of high-strength high-carbon steel and are of all-welded construction. Units available include end frames, walk-through-type frames, putlogs, straddle braces, ladder frames, horizontal braces, guardrails, posts, ladders, material hoists, side brackets, base plates, and adjustment screws.



Waco sectional scaffolding incorporates special time-saving locking devices and safety features. They are made of high-strength high-carbon steel, all welded.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 72.

NO TIME LOST!
LOADING OR LAYING ITS LOAD

A STANDARD STEEL PRESSURE DISTRIBUTOR GIVES EQUAL CIRCULATION THROUGHOUT THE SPRAY BAR FOR A UNIFORM SURFACE FROM CURB TO CURB FOR LONGER WEAR

STANDARD STEEL
PRESSURE DISTRIBUTOR

The Model 424 can be loaded in quick time for a "fast getaway". A two-way cleaning system guarantees a clean spray bar at the end of the day. First, the material is sucked out of the bar and back into the tank. Then by turning one small valve, cleaning solvent is released into pump and spray bar (without contaminating the asphalt in the tank). No time lost in tinkering — no time lost in loading — Standard Steel 424 keeps going all day long far ahead of the "gravel gang"

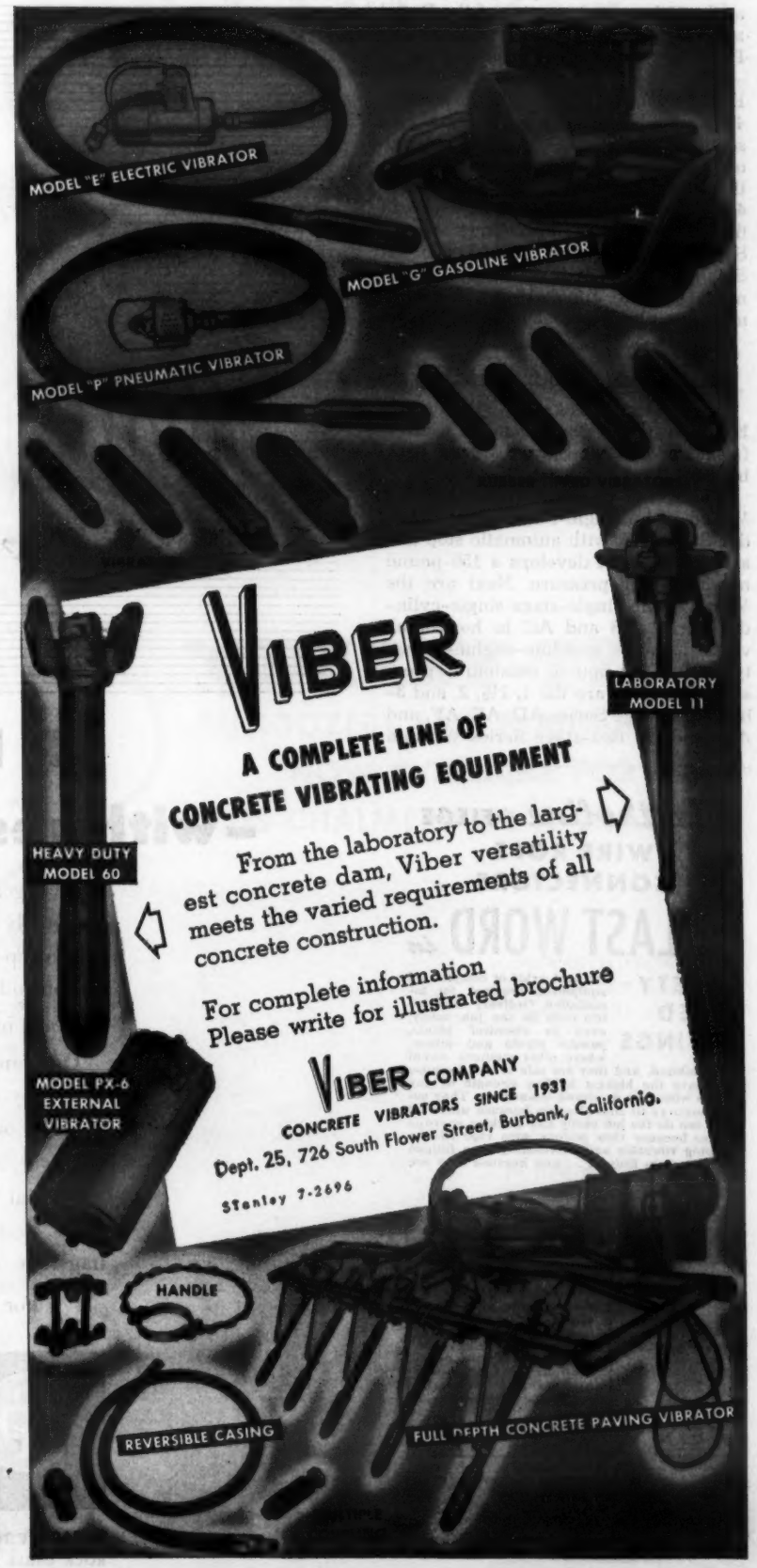
WRITE FOR CATALOG 424

OTHER PRODUCTS OF STANDARD STEEL

Maintenance Distributors, Tar Kettles, Patch Rollers, Supply Tanks, Tool Heaters, Asphalt Tools, Street Flushers, Construction Brooms.

Built to the Highest Standard

Standard Steel Works NORTH KANSAS CITY, MO.


MODEL "E" ELECTRIC VIBRATOR
MODEL "G" GASOLINE VIBRATOR
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VIBER
A COMPLETE LINE OF CONCRETE VIBRATING EQUIPMENT
From the laboratory to the largest concrete dam, Viber versatility meets the varied requirements of all concrete construction.
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LABORATORY MODEL 11
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HANDLE
REVERSIBLE CASING
FULL DEPTH CONCRETE PAVING VIBRATOR

Eight HRB Publications

The following publication announcements have been made by the Highway Research Board, National Research Council, 2101 Constitution Ave., Washington 25, D. C.:

Bulletin No. 12—"Highway Finance", 69 pages, price 75 cents. This bulletin includes five papers sponsored by the Committee on Highway Finance. Bulletin No. 13—"The Appraisal of Terrain Conditions for Highway Engineering Purposes", 99 pages, price $1.50. This bulletin includes eight papers sponsored by the Committee on Surveying and Classifying Soils in Place for Engineering Purposes. Bulletin No. 14—"Soils Committee Reports and Special Papers", 42 pages, illustrated, price 60 cents. This bulletin includes three Committee reports and two special papers. Bulletin No. 15—"Parking", a Committee report and three papers, 34 pages, illustrated, price 45 cents. Bulletin No. 16—"Expressways", a Committee report and three papers, 21 pages, price 45 cents. Bulletin No. 17—"Highway Planning", 42 pages, price 60 cents. This bulletin contains six papers presented at the 27th annual meeting of the Board as a symposium on "Uses of Highway Planning Survey Data". Bulletin No. 18—"Land Acquisition and Control of Highway Access and Adjacent Areas", 40 pages, illustrated, price 60 cents. Research Report 6-B—"Surface Drainage on Highways", Committee report and three papers, 32 pages, illustrated, price 45 cents. Bibliography No. 5—a classified index of the proceedings of the Second International Conference on Soil Mechanics and Foundation Engineering, held June, 1948; 32 pages, mimeographed, price 30 cents.

Air-Compressor Catalog

A 4-page catalog on Wilmington-Elsco air compressors can be secured from The Electric Sprayit Co. of Sheboygan, Wis.

The first of the four types listed is a ¼ and ⅓-hp single-stage single-cylinder Series AA with automatic stop and start controls; it develops a 150-pound maximum air pressure. Next are the ½ and ¾-hp single-stage single-cylinder Series AB and AC in horizontal, vertical, and gasoline-engine-driven types for 150-pound maximum pressure. The third are the 1, 1½, 2, and 3-hp single-stage Series AD, AE, AF, and AG; and the two-stage Series WE and WF. These are 2-cylinder horizontal, vertical, and gasoline-engine-driven types delivering 150 to 175-pound maximum air pressure. The last are the 3 and 5-hp heavy-duty two-stage 4-cylinder horizontal Series WG and WH for operation at 175-pound air pressure or more. There are a number of models available for each type.

This literature may be obtained from the company. Or use the Request Card at page 16. Circle No. 54.

Calumet County, Wis., owns this Meili-Blumberg Model PG 10 grader powered by an International diesel MD tractor engine. The unit is mixing black-top with its 12-foot-blade.

Electroline—FIEGE
WIRE ROPE CONNECTORS
The LAST WORD in
SAFETY
SPEED
SAVINGS

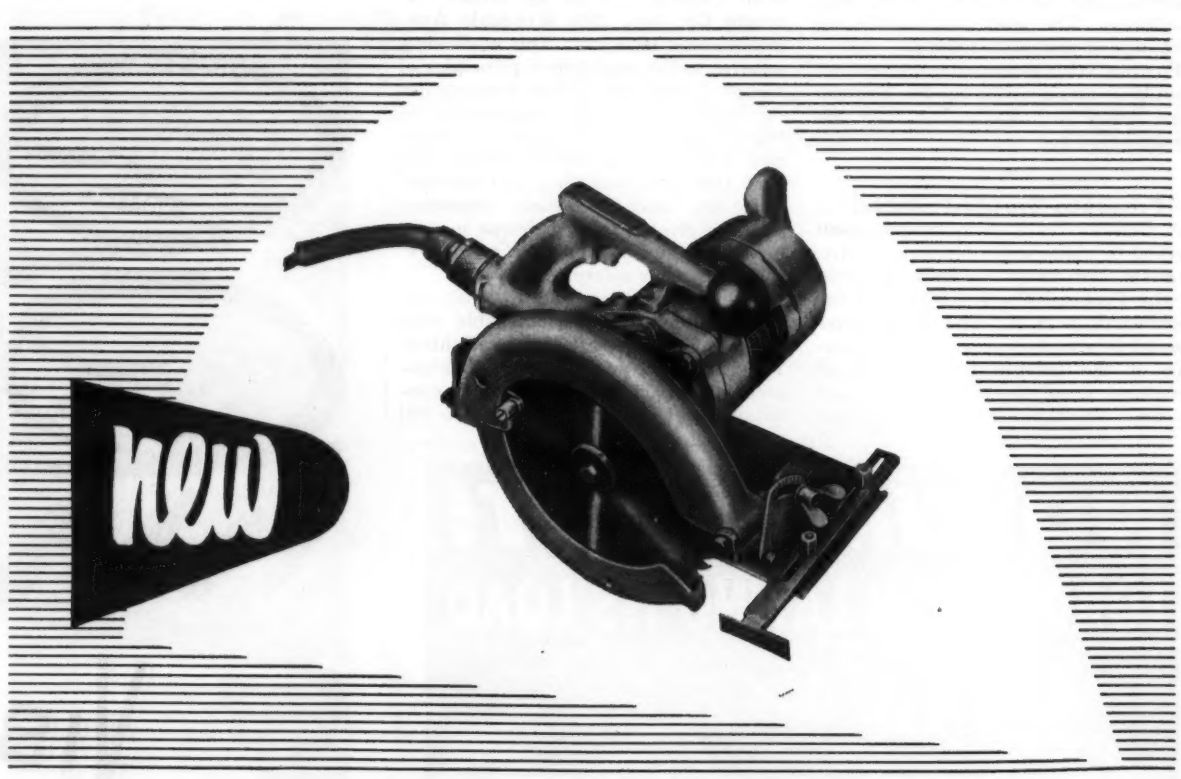
No heat, acids or complicated equipment required for installation. Ordinary mechanic's tools do the job, safely, even in chemical plants, powder plants and mines, where other methods would be prohibited. And they are safe to use, because they have the highest holding strength of any known wire rope or strand connectors. They assure *savings in installation* because unskilled labor can do the job easily and quickly; *savings in use* because they prolong wire rope life by damping vibration and overcoming rope fatigue at entrance to fitting . . . and because they are reclaimable.

Note ease of installation

Simply slip the sleeve over the cable, spread the strands, insert and drive in the plug then apply the socket. See what a solid and permanent joint you have by looking at it through the inspection hole put there for the purpose.

Send for new descriptive catalog

Electroline Company
4121 S. LA SALLE ST., CHICAGO 9, ILL.



CP Hi-Speed Electric Saws
—with reserve cutting power

Helical gearing, high blade speed, an extremely high powered motor, unusually rugged construction insure the necessary power to make fast, deep cuts in hard wood. Gearing requires only occasional lubrication and no special lubricants. Lifetime bearings are self-lubricating.

Made in three sizes: 7½", 8¼" and 9½" blades.

Outstanding features include 55° of bevel adjustment, 10° more than any other saw; easy adjustment of depth of cut from zero to 2 7/16" on the 7½" blade, 2 13/16" on the 8¼" blade, and 3¼" on the 9½" blade.

Special blades can be furnished for cutting through nails, copper, brass, bronze, lead, tile, glass, brick, clay products, concrete, marble, flagstone, asbestos, cement products and composition board.

For complete information write for Bulletin 3000.

CHICAGO PNEUMATIC TOOL COMPANY
General Offices: 8 East 44th Street, New York 17, N. Y.

PNEUMATIC TOOLS • AIR COMPRESSORS • ELECTRIC TOOLS • DIESEL ENGINES
ROCK DRILLS • HYDRAULIC TOOLS • VACUUM PUMPS • AVIATION ACCESSORIES

Concrete Pavement Laid in Mississippi

9-Mile Contract, 20 Feet Wide, Added to State's North-South Network in Delta Plantation Area

✦ ANOTHER section of reinforced-concrete pavement, 9 miles long, has been added to the state highway system of Mississippi. This newest addition is on State Route 3 in Quitman County, in the northwestern part of the Magnolia State, and extends from Marks, on State Route 6, southward through Lambert as far as Denton. The State has awarded a contract to continue the concrete paving southward an additional 12 miles to Tutwiler where two north-south Federal routes, U. S. 49E and U. S. 49W, now come together. They merge at this point and continue northward as U. S. 49 to Clarksdale. The new construction on State Route 3 will provide an alternate north-south route through the vast, flat expanses of the Mississippi Delta where some of the largest cotton plantations in the Deep South are located.

The grading for this entire stretch along Route 3 was completed two years ago. The State Highway Department awarded the 9-mile paving contract to the Cobb Construction Co. of Meridian, Miss., on its low bid of $377,213.46. A portion of the job was subbed out to the Burdine Construction Co. of Greenville, Miss. Paving started early in May, and was completed by the end of June. Of the 9-mile length, 8 miles are on open highway mostly on new location, while the remaining mile consists of municipal sections through the towns of Lambert and Marks. The roadway is built on shallow fills over the typical flat-as-a-pancake Delta terrain that is devoid of rocks, ridges, hills, or other convolutions of the earth.

Roadway Sections

Out in the country the roadway was graded 30 feet wide and topped with local sand-clay surface that had been opened to traffic since the completion of the earth-work contract. Special roadbed topping material, up to 18 inches thick, furnishes a good foundation for the new pavement. The 20-foot concrete slab has a 7-5-7-inch cross section, 5 inches thick at the center and 7 inches thick at the edges. This is achieved with a 3-inch parabolic crown in the subgrade, and a 1-inch parabolic crown in the concrete surface. On the sides are 5-foot shoulders that slope at the rate of 1 inch to the foot.

For the municipal sections through the towns the pavement is the same, but the concrete is flanked on each side by an 8-foot 4-inch strip of compacted clay and gravel 4 inches thick. Bordering these parking lanes are 2-foot 2-inch concrete curb-and-gutter sections, giving a 41-foot width between curbs.

All the concrete was laid full width with a contraction or dummy joint every 20 feet 4 inches. When the temperature kept between 55 and 70 degrees F, expansion joints were installed in the pavement at 600-foot intervals. Such was the case during the early weeks of work on the project. When the temperature rose above 70 degrees F the expansion joints were eliminated. The specifications call for joints every 300 feet when the temperatures range from 40 to 55 degrees F. No concrete is laid at below 40-degree F temperatures.

Materials and Batch Plant

The fiber expansion joints are 1 inch thick and are kept ¾ inch low as they are set up on the subgrade. Through the joints pass ¾-inch dowels, 15 inches long, on 15-inch centers. The comparatively few joint assemblies required for the job were made up in local welding shops. Dowels and reinforcing steel were purchased from supply houses in Jackson, Miss. The tie bars across the longitudinal center joint consist of transverse bars down the center

(Continued on next page)

C. & E. M. Photo

At the batch plant set up for a Mississippi concrete-paving job, a Koehring 304 crane loads a Blaw-Knox 100-ton 3-compartment aggregate bin. To the rear is a similar crane and a B-K 80-ton bin for aggregate used in curb-and-gutter work.

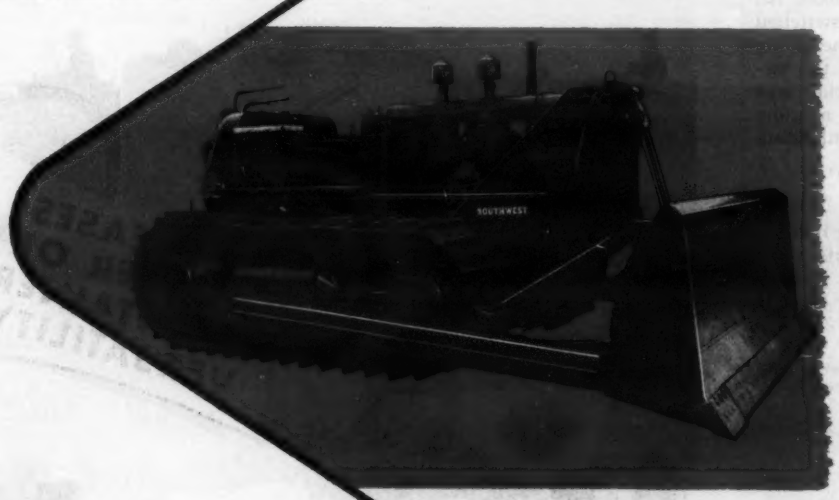
designed, made-to-order

Seats for road equipment, construction machinery, any special equipment, and farm implements.

Put S-E-L-L in your equipment. Add a comfortable, custom-built seat. Leave the details to us. Show us your requirements —for equipment in planning or production —we do the rest. Designed and made within cost specifications. Thousands of our seats used. Write, wire . . .

FLEISCHER-SCHMID CORP.
Box 99 Columbus, Nebr.

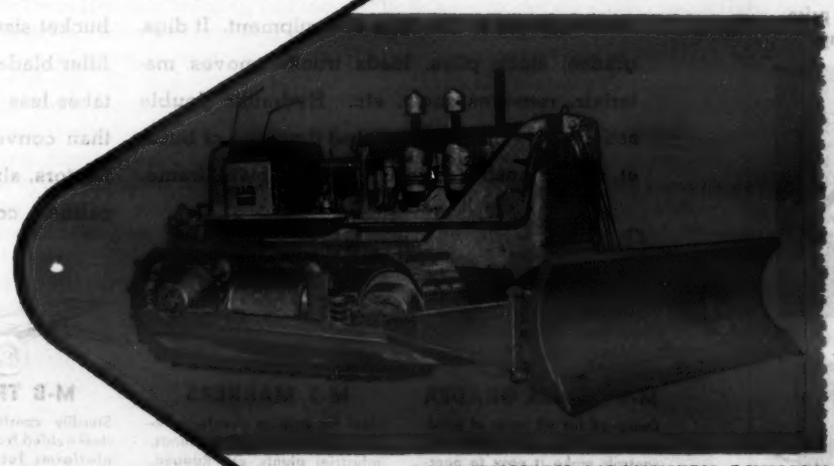
SOUTHWEST



The new bulldozer and trailbuilder equipment developed by SOUTHWEST for use with Allis-Chalmers HD-19 tractors have proved exceptionally efficient and reliable in all types of operations. These are rugged, dependable units that provide outstanding economy and long service life.

"QUARRY-TYPE"
BULLDOZERS AND TRAILBUILDERS
NOW AVAILABLE FOR
ALLIS-CHALMERS HD-19 TRACTORS

Type "AFB" Bulldozers and Type "AFT" Trailbuilders for use with Allis-Chalmers Tractors.



NOTE THESE FEATURES...
Overhead "A" frame structures entirely eliminated.
New, rugged radiator guard type mounting.
Furnished for either rear or front mounted control units.
Bulldozers can be furnished with either adjustable arms or with side arms welded to blade.

Write for Bulletin CM23

CONSTRUCTION MACHINERY DIVISION
Southwest Welding & Manufacturing Co.
ALHAMBRA, CALIFORNIA

SCOOPS BULLDOZERS CRANES WINCHES DUMP WAGONS RIPPERS TAMPERS SCRAPERS

Concrete Pavement Laid in Mississippi

(*Continued from preceding page*)

of the slab embedded 2½ inches into the concrete. These bars are ½ inch x 30 inches, and are placed on 30-inch centers. The concrete is also reinforced with 42-pound wire mesh reinforcing laid 2 inches below the surface, furnished by Laclede Steel Co.

The batch plant was set up in Lambert which is 4 miles from the north end of the project. Because of limited track facilities at the sidings, the aggregate and cement were stored about ½ mile apart. Both locations are served by the Illinois Central railroad. Cement came from the Alpha Portland Cement Co. at Birmingham, Ala., in bulk cars, and was unloaded with screw gear and enclosed elevator into a Blaw-Knox 300-barrel silo.

At the aggregate-plant site two Blaw-Knox storage bins, holding 100 and 80 tons respectively, were erected. The larger bin held sand and gravel for the concrete paving, while the smaller bin contained aggregate for the curb-and-gutter work. The aggregate came from pits in Crenshaw, Miss., and was shipped 24 miles by rail to the plant. There it was unloaded from the gondola-type cars by a Koehring 304 crane equipped with a 50-foot boom and a Blaw-Knox 1-yard clamshell bucket. An International TD-18 tractor switched the aggregate cars around at the siding with a steel-wire cable. From the aggregate stockpiles the material was loaded to the storage bins by a crane similar to the one used in unloading the cars.

Eight-Bag Batches

In paving the highway, 8-bag batches with the following dry weights were used:

Cement	752 lbs.
Sand	1,603 lbs.
Gravel	2,821 lbs.
Water	360 lbs.

The gradation of the G-1 gravel and the sand employed in the mix were as follows:

Sieve Size	Per Cent Retained	
	Gravel	Sand
2-inch	0-3	....
1½-inch	0-5	....
1-inch	5-30	....
¾-inch	40-60	....
No. 4	95-100	0-5
No. 8	....	0-20
No. 16	....	10-50
No. 30	....	30-70
No. 50	....	70-97
No. 100	....	95-100

C. & E. M. Photo

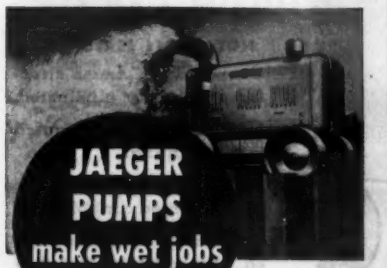
On Mississippi State Route 3, a truck carrying two concrete batches discharges into a Koehring Twinbatch 34-E paver working between the forms.

As many as 17 trucks holding two batches each hauled the materials from the plants to the paver. Most of the trucks were owned by the contractor while the rest were hired; the average haul was 3 miles. The batch trucks first backed under the aggregate bin for a load of sand and gravel, and then picked up the cement which was loaded into canvas bags hung in each compartment of the truck. These containers prevented any loss of cement from the movement of the trucks or the wind, and also kept out moisture. Flaps covering the top of the bags opened as the trucks dumped into the skip of the paver, thus discharging the cement together with the sand and gravel.

On the curb-and-gutter work, three

(*Continued on next page*)

New 2" aluminum pump weighs 105 lbs., pumps 9000 gph . . . Gives high head performance for price of low head pump.

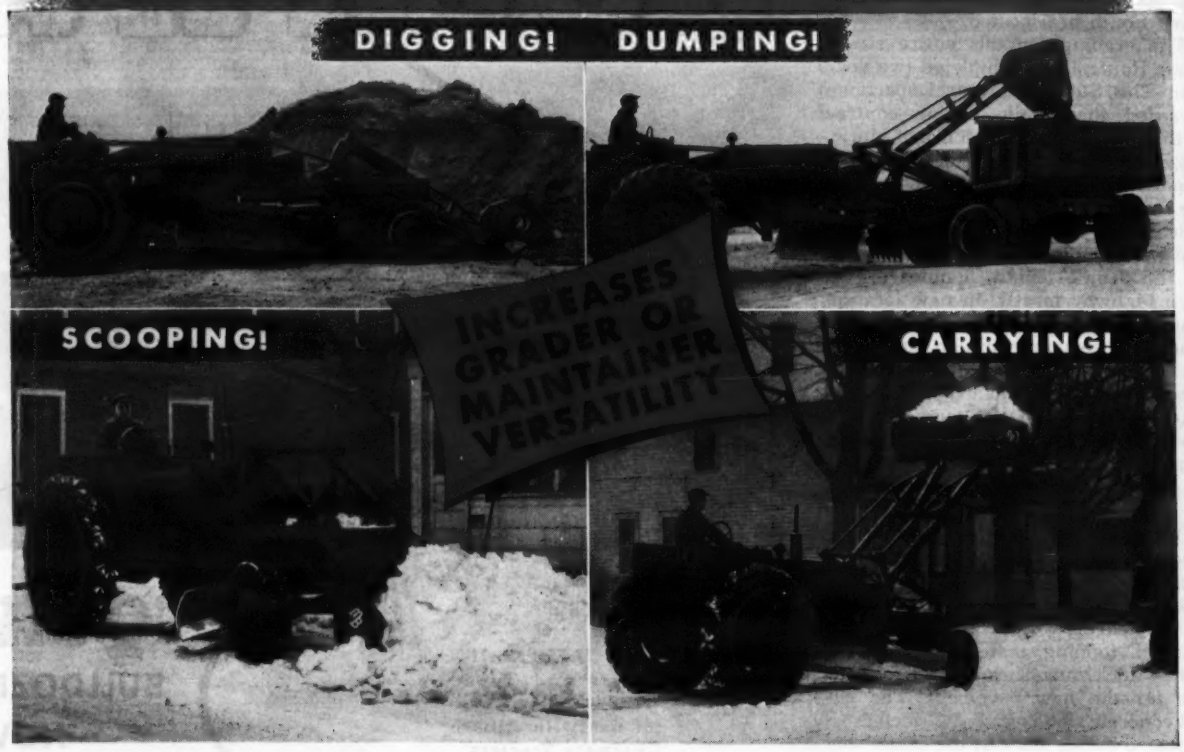


Extra power and double priming action to de-water faster. Built to outlast cheaper pumps by thousands of hours.

Heavy duty 2" to 10" models for low or high head requirements. Super-Jet pumps for pressures to 275 lbs. Diaphragm and caisson pumps. Get catalog.

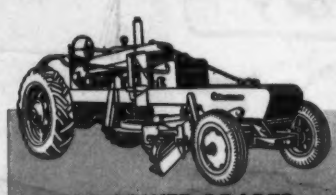
THE JAEGER MACHINE COMPANY
Columbus 16, Ohio

M-B FRONT-END LOADER . . .



The M-B Front-End Loader, mounted on M-B Power Grader or Maintainer, adds many productive hours to this type of equipment. It digs, grades, stock piles, loads trucks, moves materials, removes snow, etc. Hydraulic double acting ram actuates tilting and dumping of bucket which pushes directly against main frame.

A single lever controls digging pitch, raising, levelling, dumping and shaking operations. 2 bucket sizes. By removing bucket, either backfiller blade or crane hook can be added. Loader takes less than 30 minutes to mount. Costs less than conventional type loaders. Ideal for contractors, airports, highway departments, municipalities, counties, etc. Write for Bulletin 146.



M-B POWER GRADER

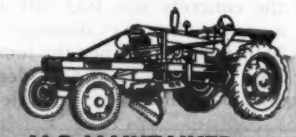
Designed for all types of grading and filling jobs. Hydraulic controls make it easy to operate. Used by state highway departments, counties, cities and industrial plants. Low operating and maintenance costs.

M-B MARKERS

Ideal for striping streets, parking areas, airports, playgrounds, industrial plants, etc. Rugged, compact construction. Hand or self-propelled models. M-B Markers are versatile to operate . . . have a large capacity . . . provide fast, low-cost striping.

M-B TRAILERS

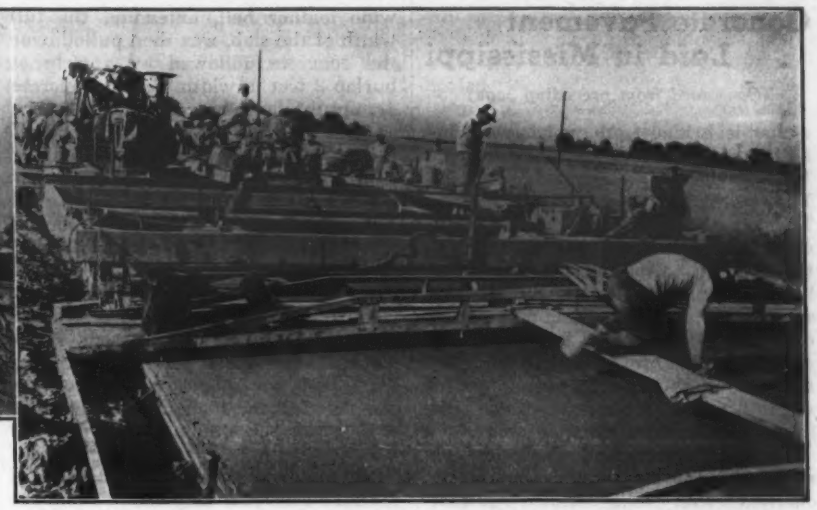
Sturdily constructed with all-steel welded frames and Tilt-Bed platforms for easy loading. Designed for hauling various types of tractors with attachments, rollers, tampers, shovels, graders, ditchers, air compressors, etc. Sizes 2½ to 10 tons.



M-B MAINTAINER

Lightweight Maintainer engineered for heavy duty maintenance work. For contractors, towns, cities and highway departments. Attachments such as cab, scarifier, power sweeper, snow plow, bulldozer blade, and leaning wheels, available.

MEILI-BLUMBERG Corp.



C. & E. M. Photos

The paver bucket on a 35-foot boom dumps a batch of concrete in front of a Blaw-Knox 2-screed finishing machine (above). Next in Burdine's paving line-up was the Koehring Longitudinal Finisher pictured at right.

Jaeger 2-yard transit mixers mounted on Ford trucks were employed. They picked up the aggregate at the smaller storage bin, next the cement, and then water from the town mains in Lambert. Concrete for the curb-and-gutter sections was poured in Heltzel forms.

Fine-Grading and Forms

While the roadway has been previously graded, some dirt was shifted about in preparing the fine grade. This was mostly handled by an Adams 511-12 motor grader. In a few locations where sizable yardage was involved, a TD-18 tractor and a Bucyrus-Erie 9-yard scraper were put into service. A Carr Formgrader cut the trench for the Blaw-Knox forms of which there were some 4,000 linear feet on the job. The usual procedure was to keep 1,000 feet of forms ahead of the paver, leaving gaps for the batch trucks to enter while they backed up to the paver skip.

Water for wetting the subgrade and for the mix itself was supplied to the paver by three tank trucks holding 1,400 gallons apiece. They took on water in Lambert and brought it to the side of the paver where it was transferred by a pump that was part of the regular equipment of the Koehring 34-E Twinbatch paver. An auxiliary water tank was also rigged up on the paver to insure an adequate supply of water at all times. As the job is on new location, regular traffic was kept on the existing gravel road.

The final grade was obtained with the help of a Lakewood planer attached to the paver and pushed along immediately in front of it, and with a Koehring pull-planer hooked to the rear of the paver. A scratch template was then moved over the forms to check the required depth. After a combined one-minute mixing period in both drums, the concrete was discharged between the oiled forms from the 35-foot boom on the paver.

Concrete Finishing

After four batches were dumped on the subgrade, a power take-off on the paver pulled along a strike-off that leveled off the concrete at the proper depth for placing the bar and mesh reinforcing. Three batches were then discharged on top of the steel in front of a Blaw-Knox 2-screed finishing machine. As the concrete was screeded off level with the top of the forms, it was vibrated along the sides with a Master vibrator carried on the finisher. This was followed by a Koehring Longitudinal Finisher.

At the center rear of the last unit, a wheel cut a longitudinal joint down the middle of the concrete slab. The Longitudinal Finisher also pulled along

(Concluded on next page)

Improved **SUPER-SPARK MAGNETOS GIVE INCREASED POWER TO ROAD MACHINERY**

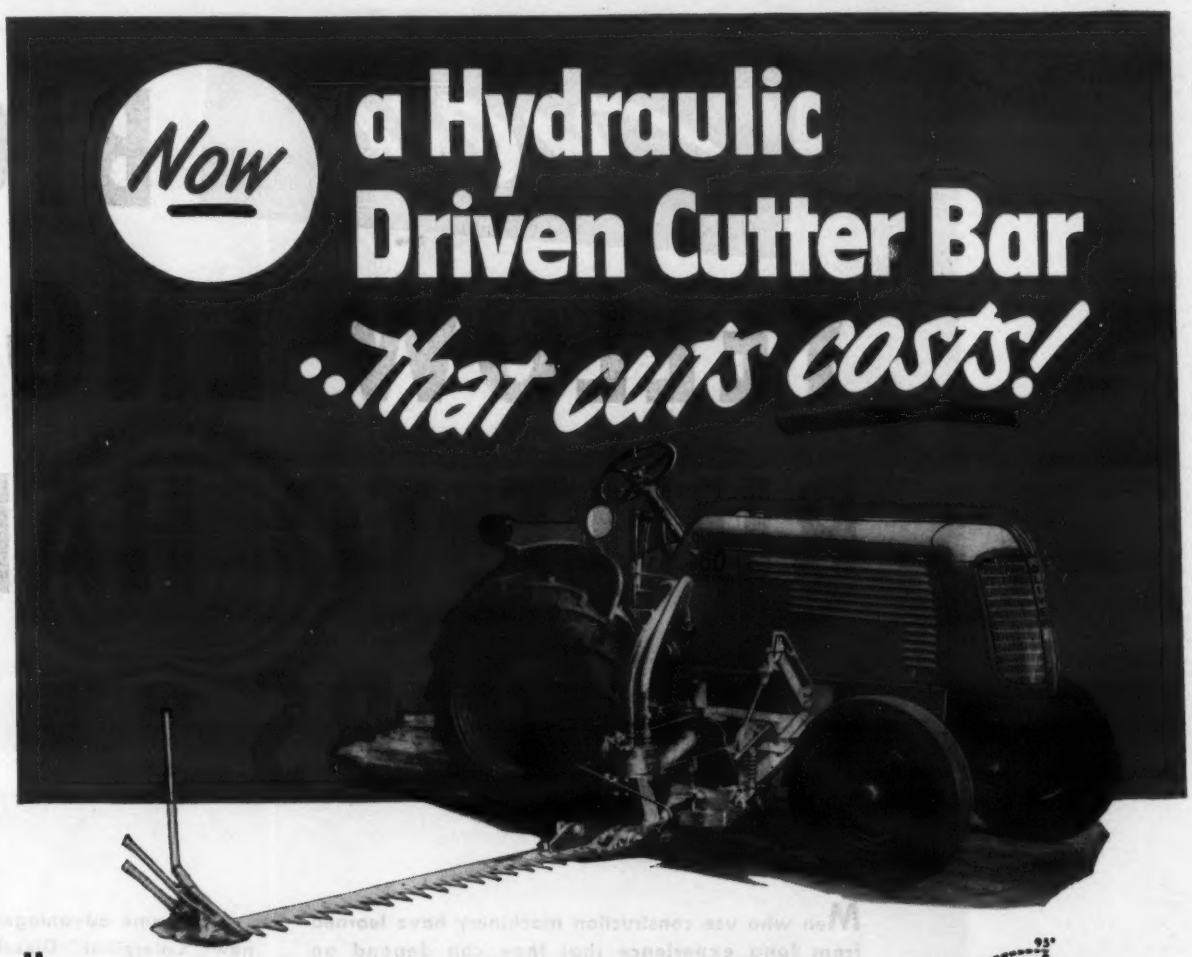
Longer life and increased power are available for your road machinery by replacing worn-out magnetos with the new FM-X type Super-Spark magneto. Improved breaker mechanism, larger bearings, improved magnetic rotor and timing facilities make the FM-X a far superior magneto.

Available for 1, 2, 4 and 6-cylinder small, medium and heavy duty engines, the FM-X supersedes the former popular FM-J type magneto.

See our nearest service station or write for details.

FAIRBANKS, MORSE & CO.
Magneto Division Beloit, Wis.

Now a Hydraulic Driven Cutter Bar ..that cuts costs!

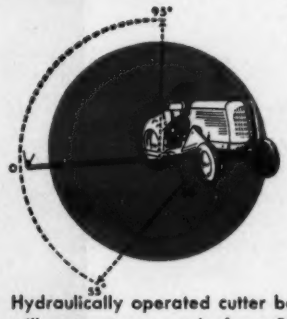


Here's the really new mowing unit that cuts mowing costs on anything from thick matted grass to moderate brush. Oliver Model "60" and "77" Industrial Wheel Tractors and Davco Hydro-Mowers assure lowest cost per mile of mowing. Here's why!

The hydraulic motor drive of the knife makes possible smooth operation. Hydraulic safety mechanism practically eliminates damage to the knife that might be caused by refuse in the mowing path.

This efficient, new unit will mow at any angle from 55° below to 95° above the horizontal. Constant speed hydraulic power enables the mower to cut right up to an obstruction. Finger-tip control that instantly raises the cutter bar hydraulically to clear obstructions...full visibility . . . and lack of vibration effectively reduce operator fatigue . . . permit more work to be done per day.

Oliver Industrial Wheel Tractors and Davco Hydro-Mowers are the ideal units for highways, railroad right-of-ways, parks, airports, and plant grounds. Your Oliver Industrial Distributor will be happy to give you all the facts on lower mowing costs or, write The Oliver Corporation, Industrial Division, 19300 Euclid Avenue, Cleveland 17, Ohio.



Hydraulically operated cutter bar will mow at any angle from 55° below to 95° above the horizontal. The shoe can be raised 18 inches above the ground level.

THE OLIVER CORPORATION

A Complete Line of Crawler and Industrial Wheel Tractors

THE OLIVER CORPORATION

"THE SIGN OF EXTRA SERVICE"

Concrete Pavement Laid in Mississippi

(*Continued from preceding page*)

a double bridge from which were inserted steel strips, 2 inches deep x ¼ inch wide, into the freshly cut joint. The steel strips came in 10-foot lengths. The transverse or dummy joints were cut to the same dimensions as the center joint, with a steel grooving template handled by two finishers, one on each side of the pavement. Steel strips were also inserted into these grooves. Their exact location was marked out by thrusting a short piece of reinforcing steel into the ground alongside the forms the required distance apart.

Behind the finishing machines the surface of the concrete was carefully checked with long-handled 10-foot straight-edges, a finisher working along each side of the pavement. A 6-inch-wide leather belt, extending the full width of the slab, was then pulled over the concrete, followed by a strip of burlap 2 feet in width. As the concrete set up, the finishers removed the strips of steel from the joints, and rounded off the edges with a ¼-inch-radius edging tool. The concrete was cured by covering it with Sisalkraft paper for a period of 72 hours. The joints were poured later with a rubber compound heated in a Standard bituminous kettle. A Kohler electric light plant was provided for the finishers in case twilight overtook them before they had completed their work. On the average, 2,000 feet of 20-foot pavement was completed in the 10-hour working day.

Quantities and Personnel

The major items in the 9-mile paving contract consisted only of:

Excavation	13,763 cu. yds.
Reinforced-concrete pavement	108,270 sq. yds.

During the peak of operations the working personnel totaled 175 men under the direction of Willie A. Ross, Superintendent for the Burdine Construction Co. of Greenville, Miss., subcontractor on the job.

For the Mississippi State Highway Department, H. L. Smallwood is Project Engineer. The project is located in District 2 of which S. S. Holder is District Engineer with headquarters at Batesville. J. Barry Brown is Assistant District Engineer.

The plans, specifications, and construction supervision were handled by the Primary Roads Division headed by R. A. Harris, Chief Engineer. E. B. Cavallo is Construction Engineer. J. B. Craig is Assistant Construction Engineer in charge of concrete-paving projects.

Accidents don't happen; they are caused. Remember: safety always pays.

Bulletin on Curbing

A catalog on standardized Chelmsford white granite curbing is now available from the H. E. Fletcher Co., West Chelmsford 2, Mass. It is a 12-page bulletin listing the specifications for, and the features of, standardized granite curb and edging. It describes each type and includes specifications for materials and placing; it also covers the basis of payment for each type of curb.

The folder covers the standardized vertical curb, slope edging, durax blocks, rubble pavement stones, isolated curb inlets, curb inlets, and bound posts. An insert gives data on the offset ordinates for a given chord (2 to 10 feet) and radius (2 to 500 feet) to the nearest ⅛ inch.

This literature is available from the company, or by using the Request Card at page 16. Circle No. 9.

new BIG YELLOW ENGINES BUILT TO HANDLE BIG JOBS

Men who use construction machinery have learned from long experience that they can depend on "Caterpillar" Diesel power. On thousands of tough jobs all over the world, the big yellow engines have proved their outstanding performance.

Now you can power larger machines—shovels, draglines, ditchers, hot-mix plants, dredges, crushers and gravel plants—with new, bigger "Cat" Engines.

In addition to present models are four great new "Caterpillar" Diesels, ranging up to 500 hp., now coming out of the world's finest, most modern engine plant. Every one of them is built with true "Caterpillar" long life and dependability. Every one is designed to burn low-cost, non-premium fuels, giving you substantial savings. Every one receives a closely supervised dynamometer run to assure proper break-in and full horsepower output.

The same advantages are offered by the four big new "Caterpillar" Diesel Electric Sets, generating up to 314 kw.

When you buy new construction machinery, specify "Caterpillar" Diesels for power. And when you consider replacing the power in present equipment, call on your reliable "Caterpillar" dealer.

CATERPILLAR TRACTOR CO. • PEORIA, ILLINOIS

More and bigger engines are now being built in this mammoth "Caterpillar" factory—the most modern, most efficient engine plant in the world.

CATERPILLAR DIESEL

REG. U. S. PAT. OFF.

WHEN YOU THINK OF DEPENDABLE POWER, THINK OF BIG YELLOW "CATERPILLAR" DIESELS

ENGINES
TRACTORS
MOTOR GRADERS
EARTHMOVING EQUIPMENT

New Federal Agency Takes Over FWA, PRA, and Others

A brand-new Federal agency, the General Services Administration, has started operations. It brings together building construction and management, property and supply, records management, and certain public-works functions of the Government. This new agency is headed by Jess Larson.

Consolidated in GSA are all functions of the Federal Works Agency, including the Public Roads Administration, the Public Buildings Administration, and the Bureau of Community Facilities. The name of the Public Roads Administration is changed to the Bureau of Public Roads.

The Public Roads Administration, previously the Bureau of Public Roads in the Department of Agriculture, was created in 1893 as the Office of Road Inquiry. During the past 10 years the PRA has aided in the construction of 98,075 miles of all types of Federal highways.

Heavy-Duty Motor Truck

A heavy-duty 2½-ton motor truck is described in a bulletin released by the Biederman Motors Corp., 2131 Spring Grove Ave., Cincinnati 14, Ohio. The Model NS truck is powered by a 6-cylinder Hercules gasoline engine, and is described by the manufacturer as a "locomotive on wheels".

The catalog contains a special insert which lists complete specifications of the Model NS, including gross rating, weight and dimensions, engine parts, axles, transmission and differential, brakes, wheels, battery, lights, wiring, instruments, etc. The insert also explains how the load of the trailer and the weight of the truck are distributed on the three axles. Included are charts of the power curve, drawings which indicate the various wheelbase and chassis dimensions, and sectional views of the truck parts.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 89.

Belt-Fastener Catalogs

Three catalogs are available on belt fasteners manufactured by Flexible Steel Lacing Co., 4607 Lexington St., Chicago 44, Ill. The first of these, Bulletin No. A-60, concerns the Alligator belt lacing which is suitable for joining conveyor and transmission belting of all the generally used kinds: leather, rubber, canvas, and composition. This lacing is available in steel, Monel, and Everdur. Sizes, specifications, and prices are listed in the bulletin.

Bulletin No. H.F. 500 lists the features of the hinged Flexco belt fastener which will make up into a separable joint. Methods of applying the fasteners, their specifications, and costs are also indicated.

Bulletin No. F-100 is the company's 4-page folder on the Flexco HD conveyor-belt fasteners and rip plates. Specifications, methods of application, tools necessary, and prices are given for the line.

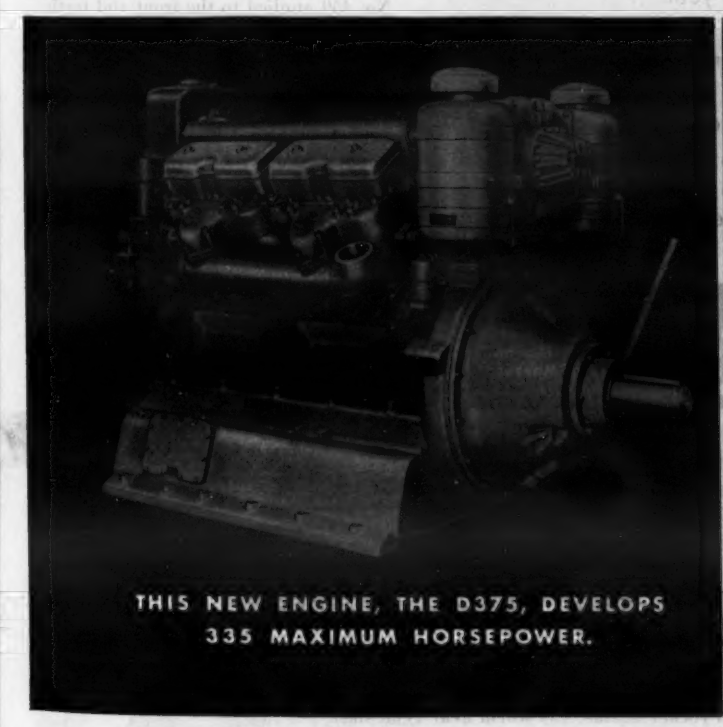
This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 18.

Fred E. Hoitt of NERBA Dies

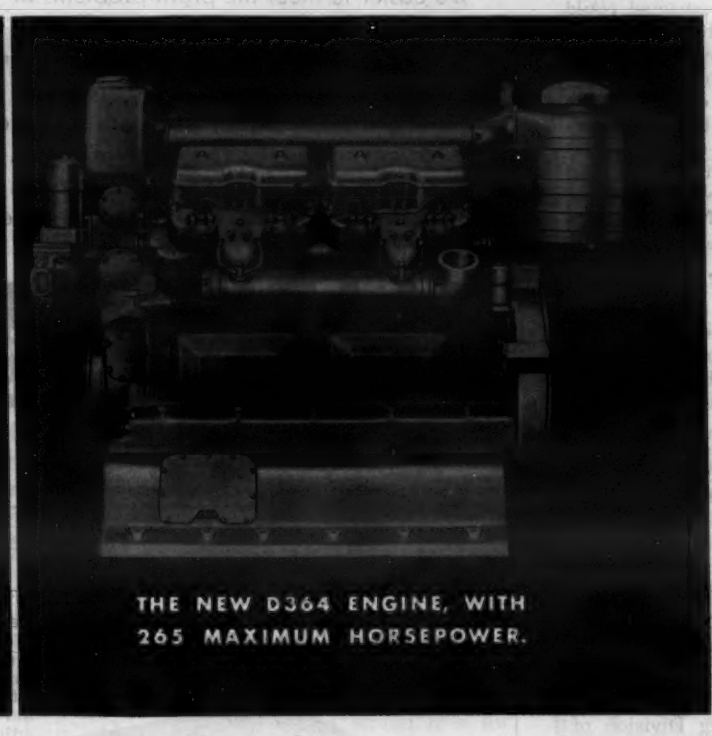
Fred E. Hoitt, Executive Secretary of the New England Road Builders' Association, died on June 25. Mr. Hoitt was a member of the Board of Directors of the American Road Builders' Association and throughout the years of his membership had taken an active interest in ARBA affairs.

THE NEW D397 ENGINE DELIVERS
A MAXIMUM OF 500 HORSEPOWER.

THE NEW D386 ENGINE, DELIVERING
400 MAXIMUM HORSEPOWER.



THIS NEW ENGINE, THE D375, DEVELOPS
335 MAXIMUM HORSEPOWER.



THE NEW D364 ENGINE, WITH
265 MAXIMUM HORSEPOWER.

CATERPILLAR TRACTOR CO.
DEPT. CE-9, PEORIA, ILLINOIS

Please send me full specifications on the new "Caterpillar" Diesel Engines and Electric Sets.

NAME_____

ADDRESS_____

CITY_____ STATE_____

The new Vibro-Plus soil compactor is a vibrating machine of a special type for compacting highway and railroad embankments, backfills, earth dams, base courses for airfields, etc.

New Soil Compactor

A new vibratory soil compactor manufactured by Vibro-Plus Products, Inc., 54-11 Queens Blvd., Woodside, L. I., N. Y., was recently used for the first time in this country. It is a vibrating machine of a special type designed for compacting road and railway embankments, backfills, earth dams, base courses for airfields, ground under floors, and other varied uses.

This compactor has a solid vibrating base plate in direct contact with the soil. The vibrating element, which is hinged to the base plate, contains two eccentrics which rotate synchronously in opposite directions. Their cooperating centrifugal force is about 9,000 pounds. It is possible, by turning the steering wheel, to tilt the eccentrics from the vertical plane and allow the machine to move forward or backward under its own power. The company states that the machine will move along horizontal ground at a speed of up to 33 feet per minute. The compactor is driven by a 10-hp diesel engine mounted on an elastically suspended plate; it may be tractor-towed for covering large free areas. Its total weight is 3,300 pounds.

This vibratory soil compactor has had widespread use in Europe. Tests made on airfields, roads, and railway embankments in Sweden showed that it compared favorably with other types of compacting equipment. Effective compaction was observed to a depth of 20 to 40 inches. This would imply that earth fills to be compacted could be spread in thicker lifts than usual. The manufacturer states that an advantage of the vibratory soil compactor is its ability to compact areas which are so small that large rollers cannot be conveniently employed.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 121.

Air-Compressor Folder

Publication of a new 4-page folder, Form E-230, descriptive of Auto-Air compressors, is announced by Davey Compressor Co., Kent, Ohio. The bulletin, complete with photographs, contains specifications of 60, 105, 160, 210, and 315-cfm truck-mounted units. It lists the various body types available and contains illustrations of 10 typical assemblies.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 15.

Friedly Now Regional Mgr.

R. C. Friedly has been appointed Central States Regional Manager for the Nelson Stud Welding Division of Morton Gregory Corp. His headquarters will be at the company's Chicago office, 600 S. Michigan Ave. Mr. Friedly joined the organization as construction-industry specialist when he returned from military service in 1946, and has served as Assistant Sales Manager since May 1948.

Radio-Telephone Sets

Long-distance and local two-way radio-telephones, both mobile and fixed units, are manufactured by the Belmont Radio Corp., 5921 W. Dickens Ave., Chicago 39, Ill., for application in the highway and construction fields.

The Raytheon mobile station, Model VM30-1, operates on a frequency range of 25-50mc and is available in either single-channel or two-channel operation. The Radiophone is compact—transmitter-receiver dimensions are 5 x 6¾ x 15 inches—and is easily mounted in any vehicle. The small power-supply unit fits under the dashboard and is supplied with either microphone or telephone hand set.

The Raytheon fixed station, Model VS50-1, has a 50-watt output and operates on standard 117-volt 60-cycle power source. It can be located anywhere in a building. For remote control a special dispatcher's unit is available for distances up to 15 miles.

The company also makes a large 400-watt fixed station.

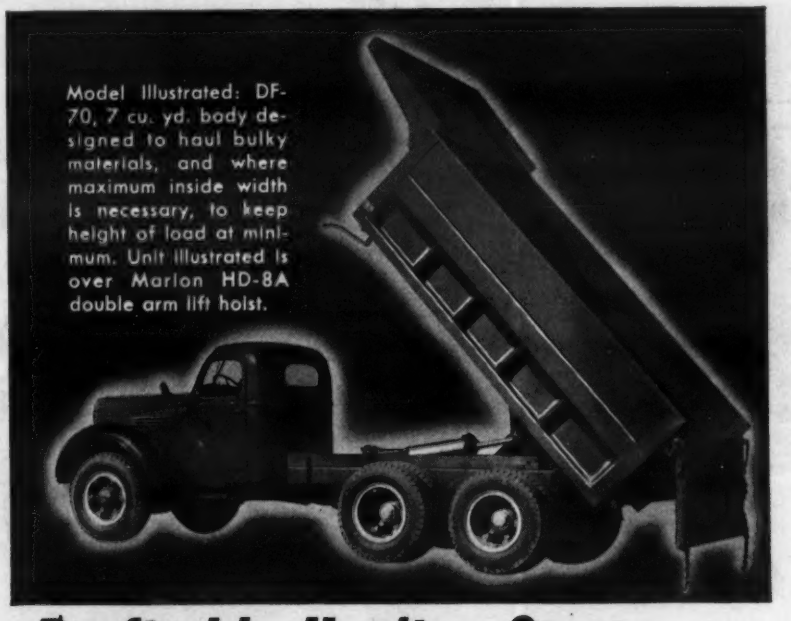
Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 52.

Aggregate Production At Harlan County Dam

An example of on-the-job production of aggregates is More & Alsop's fine-aggregate plant at Harlan County Dam in Kansas. On this job an Eagle screw washer-classifier-dehydrator teamed up with an Eagle Swintek dredging ladder to handle the sand and gravel.

The continuous cutting chain of the pump-barge-mounted Swintek loosened and agitated the deposit just ahead of the suction nozzle. This served to maintain a continuous flow of concentrated solid. The Eagle screw unit took over the washing and classifying. The particular model used featured perforated flights for better dewatering. A clean, dewatered, and classified material was delivered and then stockpiled near by.

Further information on the type of equipment used may be obtained from The Eagle Iron Works, Holcomb Ave., Des Moines, Iowa. Or use the Request Card at page 16. Circle No. 53.


Model Illustrated: DF-70, 7 cu. yd. body designed to haul bulky materials, and where maximum inside width is necessary, to keep height of load at minimum. Unit illustrated is over Marion HD-8A double arm lift hoist.

Profitable Hauling Starts with "On The Job" Design

It's easier to meet the profit problems of your hauling job with Marion. Because Marion units are developed by engineers who go out "on the job" under actual working conditions . . . they are designed for bigger payloads with fewer breakdowns under the roughest treatment. Ask your Marion Distributor about the Marion unit designed "on the job" to meet your special requirements, or write direct.

MARION
DUMP BODIES and HYDRAULIC HOISTS

GET MORE DETAILS NOW
Just mail a post card or letter for the complete Marion catalog, or ask your Marion Distributor.

MARION METAL PRODUCTS CO., MARION, OHIO

FOR HARD FACING AND REPAIR

Amsco WELDING PRODUCTS

Amsco No. 459

Increases life 2 to 5 times for dippers, pug mill knives, brick dies, shredder knives, drag chain links, pulverizer hammers, sand pumps and similar parts. Amsco No. 459 is centrifugally cast . . . resists softening up to 800° F. . . . and has a Brinell hardness of 500-600. No. 459 produces a chrome-moly martensitic iron deposit and is designed for severe abrasion service with moderate impact conditions.

The application above shows Amsco No. 459 applied to the front and teeth of a manganese steel walking dragline bucket, used for stripping overburden from iron ore at a Minnesota mine. In similar applications where more severe impact coupled with abrasion is encountered, Amsco Economy Hardface is recommended.

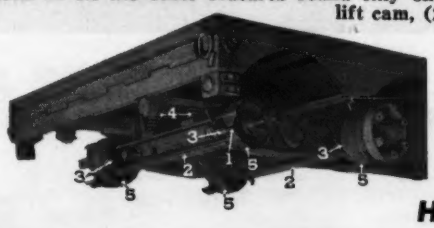
Ask for free reprint of Hard Surfacing by Fusion Welding

Brake Shoe
AMERICAN MANGANESE STEEL DIVISION

395 E. 14th St., Chicago Heights, Illinois
Offices in Principal Cities

BE SURE YOUR NEXT TRAILER HAS ALL THESE FEATURES

• Deep, wide flange main beams running the full length of the trailer, I-Beam sections for cross-members and outriggers, improved, fabricated gooseneck, and all electric-welded construction. Look at all the other features found only on Jahn tandem axles: (1) constant lift cam, (2) two full-width axles attached to longitudinal rocker beams, (3) worm gear type slack adjusters at each wheel, (4) heavy coil springs at each axle and (5) positive equalizing braking at each wheel regardless of position of axle.



JAHN TRAILERS ALL OVER the WORLD!

C. R. JAHN COMPANY
Dept. 47
212 Main St. SAVANNA, ILL.

Heavy duty trailers from 5 to 100 tons.

Convention Calendar

September 14-16—Highway Exposition
New England Highway Exposition, Commonwealth Armory and Parade Grounds, Boston, Mass. George H. Delano, Chairman, Exposition Committee, Room 1029, 53 State St., Boston, Mass.

Sept. 25-Oct. 2—Construction Exposition
Construction Industries Exposition, Houston Chapter, Associated General Contractors of America, Inc., Sam Houston Coliseum, Houston, Texas. L. W. Duddlesten, General Manager, or Russell W. Nix, Chairman, Exposition Committee, AGC Office Bldg., Gray and Crawford Sts., Houston, Texas.

October 3-5—Lubrication Meeting
Annual meeting, National Lubricating Grease Institute, Hotel Roosevelt, New Orleans, La. Harry Bennetts, Executive Secretary, 4638 Mill Creek Parkway, Kansas City 2, Mo.

October 10-14—AASHO Meeting
Annual meeting, American Association of State Highway Officials, Gunter Hotel, San Antonio, Texas. Hal H. Hale, Executive Secretary, 1220 National Press Bldg., Washington 4, D. C.

October 10-14—ASTM Meeting
West-coast meeting, American Society for Testing Materials, Fairmont Hotel, San Francisco, Calif. C. L. Warwick, Executive Secretary, 1916 Race St., Philadelphia 3, Pa.

October 24-28—National Safety Congress
National Safety Congress and Exposition, National Safety Council, Stevens, Congress, Morrison, and Sherman Hotels, Chicago, Ill. R. L. Forney, General Secretary, National Safety Council, 20 N. Wacker Drive, Chicago 6, Ill.

November 2-5—ASCE Meeting
Fall meeting, American Society of Civil Engineers, Hotel Statler, Washington, D. C. Don P. Reynolds, Assistant to the Secretary, 33 W. 39th St., New York 18, N. Y.

Roy A. MacGregor Dies; Is Succeeded by Tejan

The officers and governors of the Constructors Association of Western Pennsylvania have announced with deep regret the death of Roy A. MacGregor, Executive Secretary, on June 7, 1949. Mr. MacGregor had been the Executive Secretary of the Association since its inception in 1934.

Thurman C. Tejan, formerly a Field Representative, has been named to succeed Mr. MacGregor.

Detroit Automotive Has New Management

The controlling interest in the Detroit Automotive Products Corp., 8701 Grinnell Ave., Detroit, Mich., has been acquired from A. F. and F. D. Knoblock by S. F. Baker and the remaining shareholders.

The new officers of the firm are: S. F. Baker, President and General Manager; V. L. Anderson, Vice President and Treasurer; Charles E. Lewis, Secretary. The new Directors include the officers listed, along with Fred G. Cadwell, Claude N. Jaqua, and C. R. Cook.

The products presently manufactured by the company are the Thornton drive, Load-Booster, and NoSpin differential.

Catalog on Tractors, Trucks, and Trailers

Trucks, tractors, and trailers are the subjects of literature distributed by The Corbitt Co. of Henderson, N. C. This literature includes two catalogs and seven data sheets.

The first is a two-fold three-color catalog about four of the company's diesel truck-tractors — Models 22TD, 25TD, 27TD, 28TD. General specifications and a half page of descriptive material accompany photographs of each of the models. The same type of information for the line of gasoline truck-tractors is contained in a three-fold color catalog which covers Models 18TG, 22TG, H25TG, and 28TG. This second catalog also gives the specifications for three models of the long-wheelbase trucks.

Two of the data sheets list specifications of the four-wheel-drive truck Model 22FG and the heavy-duty truck-tractor Model H25TG. Both of these sheets include photographs and body-builder's charts of the models. A third sheet lists general information and truck and body recommendations for the special scale test body for Corbitt trucks. Two other sheets give specifications for semi-trailers with platform bodies and monocoque-construction bodies—the single Models 17FS and 17MS, and the tandem Models 34FS and 34MS.

Also available is a sheet listing in tabular form the truck-tractors required for various sizes of low-bed and semi-trailers. The last sheet lists the recommended trucks for use with the Smith-Mobile truck-mixers and agitators.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 114.

Contractors' Hoists

A hoist specifically designed for use by contractors is announced by the King Mfg. Co., 3152 W. Chicago Ave., Chicago 22, Ill. Standard gearing on the Model 560 is set to hoist a load of 750 pounds at a speed of 200 fpm using a single line. Special gearings can be provided for 1,000 pounds at 150 fpm, 500 pounds at 300 fpm, and 300 pounds at 500 fpm.

Levers for the clutch and brake are placed so that the operator faces the hoisting position during all operations. Power is provided by a single-cylinder 4-cycle air-cooled gasoline engine rated at 7.5 hp at 3,200 rpm. A governor controls engine speed and is said to open automatically when the load is applied to prevent the engine from stalling. The spool revolves freely, the manufacturer points out, so that the unloaded line returns to the ground without coaxing. The Model 560 is 27 inches in width, 36 inches in length, 32 inches in height, and weighs 420 pounds.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 96.

Do you build or operate any of this equipment? Air Compressors • Airport Tractors • Bull Dozers • Carriers • Combines • Construction Hoists • Corn Pickers • Cranes • Ditchers • Earth Drills • Earth Moving Equipment • Farm Tractors • Forage Harvesters • Industrial Tractors • Industrial Hoists • Irrigation Pumps • Logging Donkeys • Materials Handling Equipment • Mining Hoists • Oil Pump Jacks • Oil and Water Drills • Oil Well Cementing Equipment • Road Graders • Road Rollers • Rock Drills • Saw Mills • Shop Lift Trucks • Shop Mules • Shovels • Sprayers • Sweepers • Tractor Shovels • Truck Mixers • Yarders.

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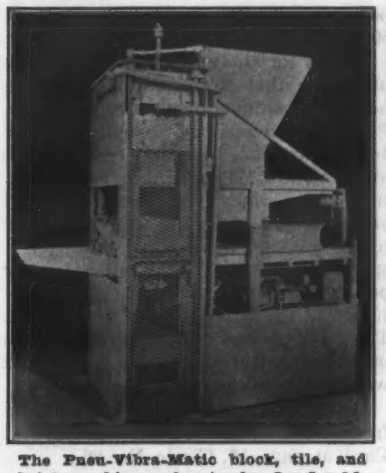


The Pneu-Vibra-Matic block, tile, and brick machine makes twelve 8 x 8 x 16-inch concrete blocks a minute.

Makes 12 Concrete Blocks per Minute

It is claimed that twelve 8 x 8 x 16-inch precision concrete blocks can be produced in one minute with the new completely automatic Pneu-Vibra-Matic block, tile, and brick-making machine manufactured by Crawford Industries, 1100 E. Second St., Pomona, Calif.

Designed to make a uniform product continually and to produce blocks of any desired type or size, the machine has an all-pneumatic block-molding operation. A heavy stabilizer on the leveling head and a special vibrator action is said to assure fully compacted even-density blocks and bricks. A replaceable mold liner insures the mold against wear, says Crawford, and as a result, block width and depth tolerances remain constant. Adjustable stops—4, 6, and 8 inches—keep block height to close tolerances. With proper conveyors supplying aggregate and removing finished blocks, the manufacturer says, this machine will continue to produce unattended.

Further information may be secured from the company. Or use the Request Card at page 94. Circle No. 16.

Two Folders on Clutches

Two bulletins, Nos. 195 and 196, are now available on the Mercury clutches manufactured by the Mercury Clutch Division of Automatic Steel Products, Inc., Canton 6, Ohio. The first is an 8-page folder which illustrates the applications of the automatic torque control for both gasoline engines and electric motors. Advantages, features, method of operation, and fields of use are presented in written and pictorial form. The second of the folders deals just with the Series G Mercury clutches for gasoline-engine application and includes a selection chart for gasoline engines.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 23.

Hyster Personnel Shifts

The Hyster Co., manufacturer of industrial trucks and tractor equipment in Portland, Oreg., has announced two personnel changes. Theron Howard, head of tractor sales and service in the eastern division of the company since 1941, is now Manager of the Peoria, Ill., plant. J. F. Lewis, formerly in charge of production and purchasing at the Peoria plant, is being transferred to Portland to assume the duties of Chief Production Engineer. He will supervise parts and service, manufacturing engineering, tool design, and inspection in Hyster's three factories. His background includes 14 years of tool designing for the Caterpillar Tractor Co. as well as work for the Olds Motor Works and Reo Motor Car Co.

New Grader Has Heavy-Duty Features

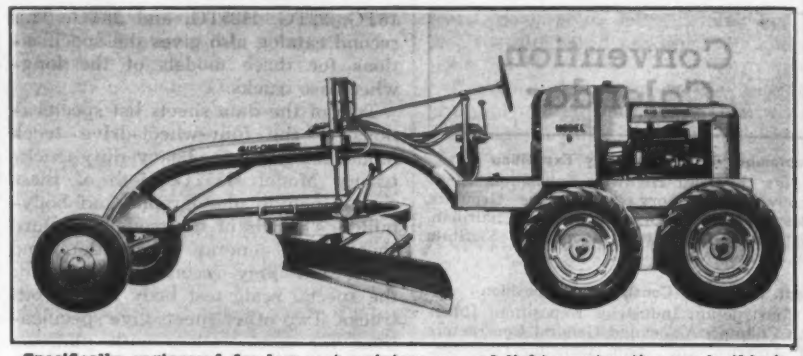
A completely new 34.7-hp Model D motor grader has just been announced by the Tractor Division of Allis-Chalmers Mfg. Co., Milwaukee, Wis. This 8,500-pound machine introduces to the low-priced grader field several big-grader features, such as tandem rear-wheel drive, tubular-frame design, and rear-mounted engine-transmission construction for improved visibility. It has been engineered for low-cost maintenance and light construction work.

The company points out that by using the new unit to maintain roads, larger and more expensive equipment can be released for more productive jobs. The model's short turning radius, its maneuverability, its quick and accurate blade control, its speed, and its low investment and operating costs are especially designed for this type of work, says the manufacturer.

Among a number of exclusive features in the Model D are the Allis-Chalmers tubular-frame design and Roll-Away moldboard. An Allis-Chalmers gasoline engine and a compact transmission which uses the transmission gears to bridge the vertical distance from engine to drive axle provide power for four working speeds, ranging from 2.4 to 18.6 mph forward, and 2.9 mph reverse.

Under soft soil conditions where flotation is important, large front tires, 7:50 x 20, are available to stabilize the grader. In addition, accessory equipment such as a hydraulically controlled scarifier, a hydraulic loader, an all-view cab, and a snow plow may be obtained.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 8.



Specifically engineered for low-cost maintenance and light construction work, this is the Allis-Chalmers 34.7-hp Model D motor grader.

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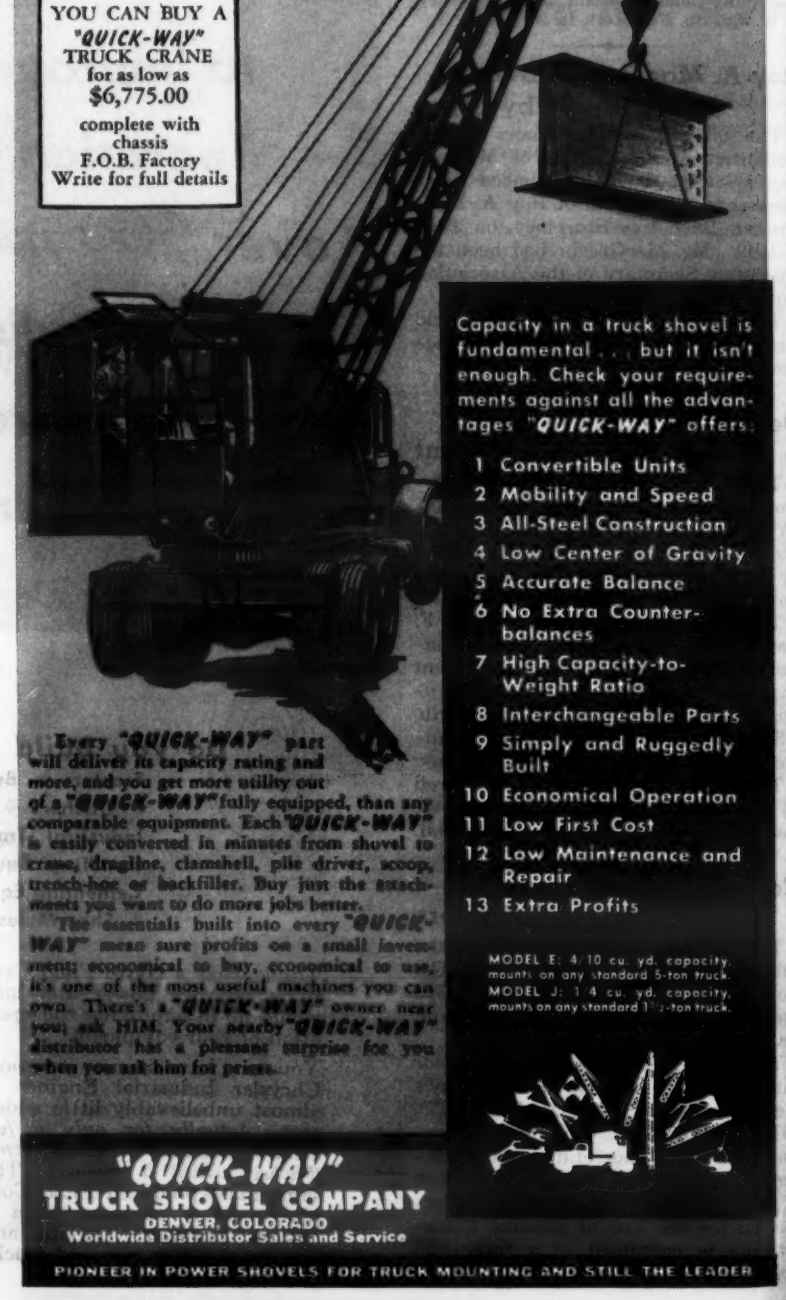
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New Runway Expands A Municipal Airport

Grading, Rock Crushing For 6,000-Foot Runway Accent Heavy Project At Sky Harbor Airport

✦ IN a determined drive to modernize its big Sky Harbor Municipal Airport, the city of Phoenix, Ariz., recently voted $1,500,000 in revenue bonds for new construction under an ultimate $5,500,000 remodeling and expansion development. Extending over a 3-year period, the work is expected to build for the city of Phoenix an air terminal in keeping with its municipal importance.

One of the important links in the new development—a new diagonal NE-SW 6,000-foot runway—was pushed as rapidly as possible this spring. Arizona Sand & Rock Co., contractor of Phoenix, had the $238,000 CAA-aid contract with the City of Phoenix. The job included grading, crushed sub-base, runway surface-course paving, lighting, and a few miscellaneous items of drainage for the 150-foot-wide runway strip. It was the second contract Arizona Sand & Rock Co. has had on the Sky Harbor Airport. Another runway and connecting taxiways have been finished.

The contractor tried hard for final completion by the end of May, having started the job March 20. With 55,000 cubic yards of grading, 65,000 square yards of aggregate sub-base course, 60,000 square yards of asphaltic-concrete surface-course pavement, seal-coat work, and the lighting system, it was no small job. Work was done 8 hours per shift on a 5-shift per week basis.

New Runway Design

The new runway will handle modern four-engine planes. American Airlines' Douglas DC-6's and TWA's Lockheed Constellations will be accommodated easily. Arizona Airways is the other major airlines company now using the field, but its planes are smaller generally than the transcontinental giants.

The minimum standard for the new runway as selected was 6,000 feet of length and 150 feet of width. Construction followed those dimensions. Native silty earth underneath the new pavement was compacted to a minimum density of 95 per cent, measured by modified AASHO test methods. The granular sub-base was designed in two courses: a leveling course from 3 to 6 inches thick, somewhat lower in quality than the uniform 9-inch lift of select crushed material lying on top of this lift. Arizona Sand & Rock Co. elected to exceed the requirements of the specifications by using select crushed material throughout, saving some time in processing the material in 6-inch lifts.

Drainage pipes, catch basins, and other such items were largely installed under the previous contract, thus eliminating this usual item largely from the present contract.

Pavement specifications called first for a prime coat of MC-1 cut-back asphalt, then a 2-inch surface-course pavement consisting of hot-mixed aggregate and 5 per cent of 85 to 100-penetration asphaltic cement, topped by a seal coat of asphalt emulsion with a fine-sand blot course.

Grading

Grading called for 55,000 cubic yards of silty dirt to be moved from 500 to 1,500 feet one way, with 900 feet a fair average haul distance for the entire job. Digging was easy, hauling conditions were generally good, water was available in hydrants on the field, and there were no great problems as sometimes show up in excavation work in Arizona.

The grading fleet consisted of a 36-yard heaped-capacity LaPlant-Choate Carrimor scraper, with a D8 Caterpillar as its prime mover; a D8-drawn LeTourneau 25-yard Carryall; LeTourneau LP and LS Carryalls, each drawn by a D7; and a new D8-mounted Caterpillar angle dozer, used straight on as a push cat.

Long-range hauling was handled by three Wooldridge Terra Cobras, with an Allis-Chalmers HD-14C pusher to assist in loading.

Processing equipment included two Caterpillar No. 12 motor graders; a No.

(Continued on next page)

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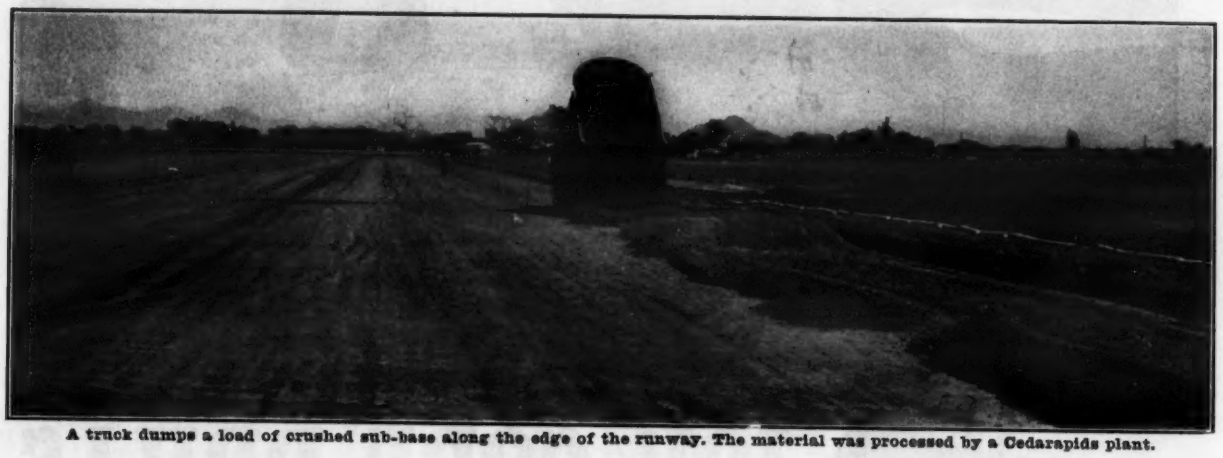
A load of dirt comes to the Sky Harbor Airport in a Carrimor scraper drawn by a D8. Average haul on the job was 900 feet.

Flaunting a red flag as a precaution against low-flying airplanes, this Caterpillar No. 12 motor grader levels dirt on the fill.

Arizona Sand & Rock Co.'s processing equipment on the $238,000 contract included this 3,000-gallon GMC-mounted water-tank truck.



A truck dumps a load of crushed sub-base along the edge of the runway. The material was processed by a Cedarapids plant.

Pneumatic rolling by this Fordson-drawn Grace rig puts the granular sub-base down for keeps at the modernized Phoenix airport.

New Runway Expands A Municipal Airport

(*Continued from preceding page*)

112 blade; one D7 with a bulldozer blade and two sections of heavy sheepsfoot rollers; a Fordson rubber-tired tractor with a Grace pneumatic roller; a 3,000-gallon GMC-mounted water-tank truck, and a 3,500-gallon truck-mounted sprinkler.

This fleet of equipment moved 6,000 cubic yards of dirt per shift for five consecutive shifts just prior to the time the job was visited, and maintained a rate of excavation close to that average throughout the job.

One of the little tricks not generally seen on grading jobs, devised here by General Superintendent J. F. Ellis, Jr., was his method of getting eight full hours of work out of his equipment.

"Suppose the machines were to go to work at 8 o'clock," Ellis explained. "I assigned a mechanic to start work at 7. It was his job to come out an hour ahead of time, to start every piece of equipment, and let it warm up. This didn't even involve any overtime, because his day's work ended an hour ahead of the equipment operator's.

"When the operators arrived, equipment was on the line, warmed up, and ready to go. The full production we got from the machines was worth at least $50 a day to the job."

The silty material dug well, and with the help of push-cat loading the scrapers brought heaping loads in to the fill. The excavation consisted generally of the removal of about 5 feet of cut in a hummock borrow area, the filling of a 3-foot low spot halfway through the new runway, and miscellaneous minor grading.

As the machines brought their loads of earth to the fill, the dirt was dumped in rough layers approximating 6 inches in thickness. A water-tank truck made a pass through the dumped material, after which it was leveled and mixed by one of the motor graders. The average water content required to compact the material was about 11 per cent, and this usually called for several water-wagon trips. The lifts were made in sections at least 500 feet long to take advantage of as much area as possible in depositing and processing the dirt.

Rolling was the hardest part of the grading. The silty material was not easy to compact to 95 per cent. Repeated rollings—sometimes as many as 10 passes by the tandem roller set—were the rule. Compaction was also aided by rolling the lifts with the loaded 36-yard LeTourneau Carryall, whose big rubber tires simulated the action of pre-stressing rollers sometimes used for this work. Where the big Carryall developed uncompacted areas, the dirt was re-processed and rolled again until it passed requirements for density.

Equipment was serviced daily on the job. Lubrication, fuel service, and minor operating repairs were made in the field by mechanics.

Pit Produces Crushed Rock

South of the airfield about ½ mile is the stream basin of Salt River. Dams upstream impound all its normal flow. At the late spring season of the year it is almost always dry. The Salt River bed, consisting of sand, gravel, boulders, and a small amount of silt, was designated as the borrow area for sub-base production.

Deposits the stream has made here over the years are quite spotty, and sometimes the mere moving of the power shovel 200 feet boosted the output of the crusher enormously. The specifications required about 45 per cent of crushed material in the granular mix, so it was simply good business to keep the shovel out of those pockets containing nothing but crushable boulders. The specifications also required 85 per cent

(*Concluded on next page*)

crushed faces on all rock.

Equipment at the pit consisted of a Marion 1½-cubic-yard power shovel, three 5-yard dump trucks for hauling raw material to the crushing plant, a Cedarapids crusher and screening unit, a 25-ton surge bin, and a fleet of four 10-yard trucks to haul the crushed material out to the job.

Raw pit-run material was loaded by the Marion shovel to the small-size dump trucks, which hauled it about 600 feet to the overhead hopper on the reciprocating feeder at the plant. This feeder then charged a 40-foot run of 30-inch conveyor belt, which carried the material to the screening decks of the plant.

The material dumped to the top 41-inch x 12-foot deck of the shaker screens. This upper deck had 2-inch screen cloth installed. Large stones retained on this screen passed through to a 25 x 40 jaw crusher, where they were reduced in size and fed back to the feeder conveyor to be re-routed over the screens.

Material passing the top deck but retained on the 1¼-inch-mesh lower deck passed through a set of roll crushers, and fed back over the main conveyor. Material passing through both screen decks was ready for the job, and was routed over a 50-foot conveyor run to a small 25-ton surge bin. A road under this bin let the big trucks pull in under the gate, receive their loads, and pull out headed for the airport.

Daily attention with hard-facing was necessary to keep the roll crushers built up. A welder worked each day on the swing shift at this work, and also on week ends. Stoody self-hardening rod was used almost exclusively. The welder also worked on the power-shovel bucket, combating severe abrasion wherever he found it—and it was plenty much in evidence.

Paving to Be Laid Soon

Hot-mix paving began as soon as enough grade was laid ahead to keep the operation continuous. Arizona Sand & Rock Co. operates its own commercial asphalt plant in Phoenix. The material was batched from this plant, hauled to the job in trucks, and laid by a Barber-Greene Tamping-Leveling Finisher.

A small amount of concrete paving for a warm-up apron at one end of the runway was laid. The portland-cement concrete was also batched commercially. Outstanding feature of this part of the work was the placing of Para-Plastic rubber joint material as soon as the concrete set up, thus eliminating the usual expensive joint-cleaning work later with sand and air.

Personnel

Ed Ryan, Grade Foreman, assisted General Superintendent J. F. Ellis, Jr., in directing field contract work.

The job was planned and directed under the engineering supervision of Johannessen & Girand, Consulting Engineers of Phoenix, and was represented by Mike Brady as Resident Engineer in Charge.

Testing Co. Adds to Staff

The United States Testing Co., of Hoboken, N. J., recently added F. L. Fish, Michael Powsner, and E. H. Winkleman to its staff. As a service representative, Mr. Fish helps plastics firms develop testing and research programs utilizing the company's new plastics laboratory. Mr. Powsner is working as an assistant supervisor in the recently formed Engineering Inspection Division of the company. Mr. Winkleman is helping research clients to develop ultrasonic solutions to industrial problems.

C. & E. M. Photo
In a cloud of dust, this Cedarapids crushing-screening plant produces granular subbase material for Sky Harbor Airport.

Story of R. G. LeTourneau

"Moving Heaven and Earth" is the apt title of the biography of R. G. "Bob" LeTourneau. This is the story of an interesting personality in the American scene—a successful business man and an evangelist as well. The book was written by Donald F. Ackland, former Assistant Editor of "The Christian" magazine and one of the executive staff of the London City Mission Society.

The book combines the story of Mr. LeTourneau's life with photographs and descriptions of the powerful construction machinery which bears his name. It tells of his birth and ancestry, of his interest in machines, of the establishment of the LeTourneau factories, of his religious activities, and other aspects of the life of an unusual personality. The book contains a dozen and a half photographs of LeTourneau, of his equipment in use in war and peace, and of the LeTourneau production facilities.

Copies of this 224-page book can be obtained by writing to Iversen-Ford Associates, 175 Fifth Ave., New York, N. Y. Cost of the book is $2.00.

J. D. Berg Dies at 66

J. D. Berg, Chief Executive Officer and a Director of Dravo Corp., Pittsburgh, Pa., died recently in his home in Chatham, Cape Cod, Mass., at the age of 66. Mr. Berg had headed the corporation since the deaths of its founders in 1934.

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Julius Gaussoin, president of the Silver Eagle Company, Portland, Oregon, haulers of petroleum products in Oregon and Idaho, is high in his praise of Fuller Transmissions and Auxiliaries. He says:

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The average mileage of Mr. Gaussoin's trucks . . . all units are full truck and full trailer . . . is 11,300 miles per month. Three of his trucks have totaled more than 2,000,000 miles—over 700,000 miles each.

Mr. Gaussoin's statement is based on the Silver Eagle Company's long experience with Fuller Transmissions and Fuller Auxiliaries . . . an experience that has been shared by thousands who recommend them without reservation: to the driver for easier shifting . . . to the mechanic for simplified servicing . . . to the owner for longer work-life.

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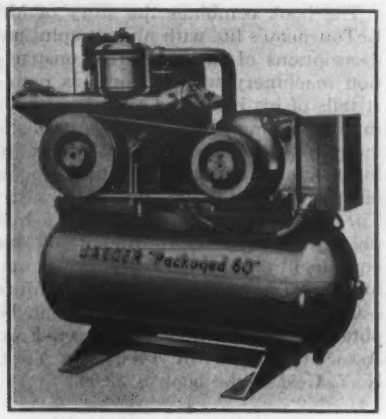


The Packaged 60 rounds out Jaeger's line of stationary compressors, 60 to 365 cubic feet per minute.

Air-Cooled 60-CFM Packaged Compressor

The Jaeger Machine Co., 701 Dublin Ave., Columbus 16, Ohio, has recently announced its Packaged 60 stationary compressor. This is a complete ready-to-operate air-power plant which, the company says, offers the heavy-duty dependability of the larger compressors in a 60-cfm unit.

It consists of a 2-stage V-belt-driven air-cooled compressor and 15-hp electric motor, mounted on an 8.5-cubic-foot air receiver with base, and all electrical controls. The compressor is the maker's Air-Plus unit, with two low-pressure cylinders and one high-pressure cylinder arranged in W form for maximum balance, ease of operation, and minimum vibration.

Force-feed lubrication, air-cooling, large streamlined air passages, oversized valves, and efficient cooling of air between compression stages are features which, the firm claims, contribute to the unit's dependable low-cost delivery of 60 cubic feet of 100-pound air per minute at moderate temperatures. Maximum working pressure is 125 pounds.

This unit rounds out the company's line of stationary compressors—60 to 365 cfm—for electric-motor or gasoline-engine drive.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 10.

Pressure-Placed Concrete

A contracting service for the placement of Gunite is described in a 44-page catalog issued by the Pressure Concrete Co., 193 Emmet St., Newark, N. J. The catalog explains the Gunite process—what it is, the materials used, and how it is applied. It lists the general physical properties of Gunite including its strength, resistance to weathering and frost action, resistance to heat and chemical attack, density, adhesion or bond, absorption, expansion, modulus of elasticity, and waterproofness. It also covers specifications of the materials used, their proportions and manner of mixing, preparation of surfaces, thickness, how to shoot the Gunite cement, and curing.

The catalog contains a series of pictures illustrating the various types of work for which Gunite is recommended. Shots "before and after", and "during", show building reconditioning; construction of dams; lining sewers, flumes, irrigation ditches, and tunnels; prestressed tanks; concrete-tank repair; repair of piling and piers; beam encasement; etc.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 97.

Reardon Opens in Texas

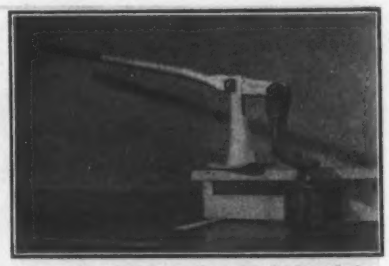
Reardon Industries, Inc., Cincinnati, Ohio, maker of concrete colors, chemicals, and hardeners, has opened an office and plant at 2300 Rothwell St., Houston, Texas. Donald Dillon has been promoted from the main works at Cincinnati, Ohio, to assume the post of Texas Manager.

Carry-Type Scrapers

Two all-purpose carry-type scrapers, the M-7 and the D-2, are made by Murray Mfg. Co., Modesto, Calif. The former weighs 4,000 pounds, requires 30 to 40 hp, and carries 4¼ cubic yards heaped. The second weighs 2,500 pounds, requires 15 to 25 hp, and carries 3½ cubic yards heaped.

The M-7 model has a cutting-edge width of 84 inches, a wheelbase of 130 inches on six 6-ply tires, and an overall length and height of 200 inches and 68 inches respectively. The D-2 model has a cutting-edge width of 72 inches, a wheelbase of 119 inches on two 6-ply and two 4-ply tires, and an overall length and height of 185 inches and 58 inches. Both have full hydraulic control.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 27.



The Jiffy stake puller is designed to remove form pins quickly and easily. A downward push on the handle lifts out the pin.

Form-Stake Puller

A handy device designed to remove form pins quickly and easily is made by Tigerman Engineering, 627 N. Silver Spring Road, Milwaukee 11, Wis. This Jiffy stake puller works like a pump, the manufacturer points out. Form pins can be driven flush with the top of the forms. When it is time to remove them, the puller is attached to the top of the pin by the handle; then an easy push downwards lifts out the pin.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 58.

Corrosion Prevention

A new booklet, Bulletin 62, entitled "Stop Corrosion With Metallizing" has recently been released by Metallizing Engineering Co., Inc., 38-14 30th St., Long Island City 1, N. Y. The publication points out that metallizing saves money by giving permanent protection to all sorts of iron and steel equipment. This equipment, it explains, if protected by spraying with zinc or aluminum, will require no further maintenance for 15 to 20 years. The folder cites cases where this treatment has been used with success and pictures filter beds, bridges, dam gates, etc., being sprayed. A table on the life expectancy of metallized coatings is included.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 24.

THE TIGER BRAND SPECIALIST VISITS THE PENN-LINCOLN PARKWA

and learns a trick or two about wire rope care

"I stopped to see Charlie Dinardo the other day. He's in charge of Dinardo, Inc.'s job of building the 980-foot concrete arch bridge over Nine Mile Run in the Penn-Lincoln Parkway project at Pittsburgh. It's one of the biggest concrete arch jobs in the country in recent years.

"About 15,000 yards of ready-mixed concrete go into this bridge, and 98% of it is being poured by cranes—all equipped with Tiger Brand Wire Rope. They were pouring about 250 yards a day, using a one-yard bucket on a crane equipped with a 105-foot boom and 18-foot jib. In addition to the pouring, the four cranes have handled all steel erection and form setting on the bridge. A job like this really puts rope to a test!

SUPERINTENDENT Charlie Dinardo tells the Tiger Brand Specialist how he obtains maximum life from his Tiger Brand Wire Rope on this rugged job.

"Charlie says he is getting plenty of service from his Tiger Brand Rope. It holds up for three months' steady work on the hoist, and he hasn't replaced a boom rope in over a year.

"Charlie passed on a couple of tips on how he gets this kind of service on such a rugged job. First, he uses nothing but Tiger Brand. Second, he observes extra precautions during installation, being especially careful not to introduce any twist into the rope.

"That's this veteran contractor's method of obtaining exceptionally long rope life. I'm glad to pass it along to you."

ARE YOU GETTING THE MOST FROM YOUR WIRE ROPE?

The TIGER BRAND Specialist—an experienced field service engineer—draws on his own experience and that of veteran construction men like Charlie Dinardo to help you get the best performance from your wire rope at the lowest possible cost.

He'll be glad to talk over your problems with you and make suggesitons. Meanwhile, write for our booklet "Valuable Facts About the Use and Care of Wire Rope." You'll find it helpful.

Cape Cod Bulldozer Unearths Skeleton

Bertram Rose, New England contractor, began excavating for a housing project at Hyannis, Cape Cod, early one morning last April. Imagine his state of mind when, in the gray light of dawn, the HD-5G Tracto-Shovel he was operating unearthed a large leg bone.

"I thought it was a horse bone," Mr. Rose said afterwards; "then I saw a skull with teeth and I backed away, saying, 'That's human!' I went to the police station and they came up at once. I took the bulldozer and trimmed off 6 inches, then 10 more, very carefully, and we turned up a second skeleton without hurting it."

That was enough for the police. "Hands off!" they said. "Send quick for Harvard." But Mr. Rose's curiosity was whetted now. He nosed around some more with the bulldozer, very gently, and uncovered a tiny foetal skeleton about 3 feet away.

Bertram Rose, New England contractor, parks his new tractor before an outdoor sign he built and painted himself. At night, electric lights make the Tracto-Shovel appear to be digging, lifting, and dumping.

The Harvard anthropologists pronounced the skeletons "unquestionably Indian", since the teeth were ground down from eating gritty foods and from chewing hides to soften them. Both the male and female skeletons lay on a slight incline with feet towards the water of Lewis Bay, in an aboriginal style of burial practiced from pre-Columbian times. Why the triple burial? Disease, perhaps, or the family may have been slain in inter-tribal warfare and buried later by members of its clan.

Mr. Rose, hero of the discovery, was born a Cape Verde islander, came to Nantucket when he was two, grew up and received his schooling in New Bedford, and set up his own contracting business at East Sandwich in 1946. Previously he had worked on the Merritt Parkway in Connecticut, the Army airport at Newbery, N. Y., and on many other important jobs. His three youngsters are very proud of him. These days it's not everyone's daddy who has dealings with the Indians.

Small Paint-Spray Unit

A portable spray outfit with an 8-ounce capacity is announced by Portable Electric Tools, Inc., 255 W. 79th St., Chicago 20, Ill. The Spray-Master Model SM-14 is powered by a 110-volt ac/dc motor, with motors of other voltages available on request. The motor is belt-connected to a single-cylinder die-cast Zamac compressor.

The unit can be used to spray lacquers, enamels, insecticides, paints, and other solutions. It is supplied with a 10-foot rubber hose and a 6-foot rubber-covered electric cord and attachment plug. The Spray-Master is 6 x 10 x 9 inches in size, weighs 7 pounds, and operates at 14 pounds of pressure.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 103.

Rock or Gravel Crusher

A 4-page illustrated catalog, Bulletin 151, on Symons intermediate cone crushers for rock, gravel, and ore reduction has been issued by the Nordberg Mfg. Co., Chase and Oklahoma Aves., Milwaukee 7, Wis. This folder gives the specifications and the features of the 22 and 30-inch crushers, with capacities of 15 to 45 and 20 to 60 tons per hour. A cross-sectional engineering drawing exposes all of the working mechanism of these Symons cone crushers. The catalog also mentions that the intermediate cone crusher is available as a packaged unit, with electric motor or engine drive, and mounted on a welded steel supporting base and skid to facilitate moving.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 77.

GMC Division Changes

Organizational changes in the Truck Division of GMC Truck & Coach, Pontiac, Mich., are announced.

R. C. Woodhouse, formerly GMC Regional Manager for the southwest, is promoted to the position of Assistant General Sales Manager of the Truck Division at Pontiac, Mich.

R. E. Holsaple, formerly Zone Manager for GMC in Charlotte, N. C., takes the newly created position of Metropolitan Sales Manager in charge of GMC's four retail operations in Chicago. He is succeeded by G. R. Blackburn who, for the past few years, has headed the Sales Organization and Analysis Department at the factory in Pontiac. A. B. Campbell, formerly Mr. Blackburn's assistant, will succeed him and head up this department.

W. P. Smith becomes Retail Store Manager for GMC in Cleveland, taking over this position from Glenn G. Bennett who has resigned to take a GMC dealership in Phoenix, Ariz.

980 FEET LONG . . . 100 feet high at the lowest point in the valley . . . this three span concrete arch bridge carries the new Penn-Lincoln Parkway west toward the Squirrel Hill Tunnels in Pittsburgh, Pa. Dinardo, Inc., Pittsburgh, is the contractor.

98% OF THE CONCRETE in this job is being poured by cranes—equipped with Tiger Brand Wire Rope.

SEND FOR THIS BOOKLET

American Steel & Wire Company
Rockefeller Bldg., Dept. O-8
Cleveland 13, Ohio

Gentlemen:

Please send me a copy of your booklet, "Valuable Facts about the Use and Care of Wire Rope."

Name .....

Company .....

Position .....

Address .....

City ..... State .....

AMERICAN STEEL & WIRE COMPANY, GENERAL OFFICES: CLEVELAND, OHIO
COLUMBIA STEEL COMPANY, SAN FRANCISCO
TENNESSEE COAL, IRON & RAILROAD COMPANY, BIRMINGHAM, SOUTHERN DISTRIBUTORS
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

USS

AMERICAN TIGER BRAND WIRE ROPE

Excellay Preformed

UNITED STATES STEEL

Automatic Control For Trailer Brakes

A self-contained hydraulically operated brake-controlling device for use with trailers is announced by The United Mfg. Co., 46 Interstate St., Bedford, Ohio. It is designed to apply the brakes of the trailer whenever the towing vehicle slows or stops. Any slowing down actuates a hydraulic cylinder on the Titanic surge-control device so that an equal braking action is applied simultaneously and automatically to the trailer's brakes, the manufacturer explains. The device is said to release the trailer brakes immediately when the towing vehicle pulls away, eliminating all tendency to drag.

The Titanic is for use with 11, 12, and 14-inch mechanical brakes and on all types of 2 and 4-wheel trailers with capacities up to 5 tons. The complete unit consists of a hitch, hydraulic cylinder and mounting bolts, manual brake for parking, breakaway safety cable with snap connector, and brake equalizer and cable. Three types of hitches are available: ball and socket, lunette, or clevis. The device requires no special attachments on the towing vehicle, the manufacturer reports. Its special safety feature is the breakaway cable designed to actuate the lever of the manual parking brake and lock the trailer brakes in the event of accidental unhitching.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 95.

Heavy Suction Hose

Vitalic 367 is a smooth-bore crush-proof suction hose built specifically for use in the contracting industry by the Continental Rubber Works, 1902 Liberty St., Erie, Pa. The company states that the distinctive, corrugated, cord-reinforced construction of the hose makes it crush-proof, prevents collapsing at bends, and enables the hose to resume its shape automatically.

The tube is made of abrasion-resistant rubber compounded for heavy-duty operations. The reinforcement is a heavy-duty cord imbedded in rubber between layers of multiple-ply square-woven fabric. The use of cord instead of wire, says the company, is what allows the hose to resume its normal round shape. This hose is available in sizes of 1½, 2, 2½, and 3 inches.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 49.

Load-Handling Forks

Pallet-less hydraulically operated loading forks for lifting bricks, barrels, boxes, and bags are now available for all models of fork-lift trucks manufactured by The Buda Co., Harvey, Ill. One of the features of these all-purpose gripping forks, the company explains, is that they keep a positive grip on the load until the load weight is relieved.

These gripping forks come in three main styles: two forks for holding the sides of a barrel or drum or a unit load of package goods, four rubber-padded forks for gripping the bottom tier of bricks, and four semi-curved forks for lifting two rows of bags.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 7.

Line of Safety Goggles

A descriptive data sheet dealing with safety goggles and featuring the A-100 acetate-frame goggle with Safe-T-vis lenses is available from The Univis Lens Co. of Dayton, Ohio. This bulletin describes the features and lists the sizes available for five different models of the company's line. It emphasizes the lightness of the goggles; their impact resistance; and the fact that they are unaffected by pitting from grinding sparks and welding spatter.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 80.

Information on the Care Of Surveying Instruments

The 51st edition of the "Manual of Surveying Instruments" has been published by W. & L. E. Gurley, Troy, N. Y. This new edition combines specific details about the adjustment of Gurley instruments with related factual information and practical instructions on the care and handling of all transits, levels, alidades, compasses, and accessory surveying equipment.

Included is a complete explanation of the theory and application of the Beaman stadia arc, types of reticles and reticle patterns for particular purposes, level vial construction and use, as well as assorted tables of logarithmic and natural functions, and distance and elevation stadia readings.

The booklet has 166 pages and contains 99 illustrations. Instructions for the use of each Gurley instrument are interwoven with a continuing guide to and discussion of good surveying practices. Copies are available at $1.00 each.

Folder on Spot Welders

An 8-page catalog about the Dyer spot welders is available from the Topeka Foundry & Iron Works Co., 300 Jackson St., Topeka, Kans. It gives complete specifications and recommends uses for the company's line of spot welders.

The leaflet describes the four bench models with a range of 2½ to 10 kva, and six floor models with a range of 10 to 35 kva. A built-to-order 100 to 300-kva heavy-duty model may also be obtained. The catalog points out that these are manually operated 220-volt 60 cycle single-phase spot welders. However, air operation may be added to any of the models listed, as may timing equipment, and motor-driven units may be added to any of the floor models. Rated ampere capacity for the units is also included in the catalog.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 66.

DON'T Handicap

1

A striking demonstration of climbing power in the front wheels. These power-driven wheels—under actual operating conditions—make it possible to *work* in places where ordinary motor graders cannot *go*.

2

No ordinary motor grader can carry its own weight through windblown sand. The A-W Power Grader, with the climbing power of its live front end, stays on top of the sand under perfect control—and builds roads with ease and speed.

3

Long, steep banks present no problem. Power on the live front end, plus front and rear end control through All-Wheel Steer means there can be neither slipping nor sliding while pulling the load.

4

All-Wheel Drive makes it possible to mount attachments at no sacrifice of operating efficiency. In the operation shown at the right, the entire weight of the back end of the grader is carried on the rolls.

Three New Air Tools

Worthington Pump & Machinery Corp., Harrison, N. J., has announced three newly designed Blue Brute air tools for the construction field: a clay digger, a trench digger, and a breaker.

The company states that the new tools feature refinements in design and manufacture, including a four-bolt handle, built-in lubricator, replaceable chuck bushing, replaceable bronze cylinder bushing, and interchangeable handles. Two major advancements are incorporated in the new design — a streamlined latch-type retainer, which enables trimming and breaking in close quarters without damaging the retainer fulcrum pin, because there are no side projections; and a new, simple metering-type valve which is unaffected by wear, the company claims. The new design also provides larger bearing surfaces and shorter piston travel.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 130.

Hose-Clamp Catalog

A 4-page folder describing the Le-Hi hose clamps is now available from the Hose Accessories Co., 17th and Lehigh Ave., Philadelphia 32, Pa. This bulletin, No. 125, lists the more than 160 different sizes and types in the company's line. The size numbers, hose size designations, and net weights are given below illustrations of each of the clamp series.

Included in the catalog are universal-type hose clamps, single and double-bolt clamps for shank couplings, interlocking-type high-pressure clamps in sizes up to 4-inch oversize, double-bolt hose clamps, and band-type hose clamps. Featured is a group of new undersize high-pressure hose clamps, interlocking type, designed especially to fit the new small-OD hose types.

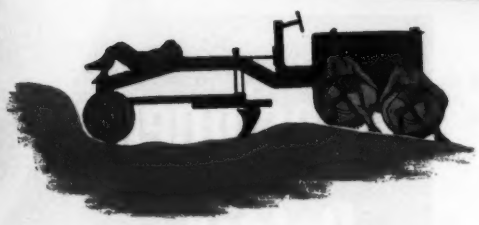
This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 61.

Chain Belt Dist. Sales Mgr.

The Chain Belt Co. of Milwaukee, Wis., announced recently that Charles Pingry had been made District Sales Engineer to the Dallas office.

YOUR HORSEPOWER!

A Motor Grader with ALL-WHEEL DRIVE has 30% more power-at-the-blade than one with rear drive only



The front end of the conventional grader is *dead* weight, contributing nothing to traction—*lazy* weight, consuming power to no purpose. Every pound of weight not carried on a driving wheel *handicaps your horsepower.*

Every pound of the A-W Power Grader is useful, working weight—contributing 100% to traction, utilizing the whole output of the engine, and delivering maximum power where it counts—*at the blade.*

ON JOBS LIKE THESE AND DOZENS OF OTHERS

Austin-Western "88" and "99" Power Graders pay extra dividends. The live front end of the grader adds 30% more power at the blade—power where it counts—in mud, in sand, in ditches and on banks. For maximum traction—primary element in power grader efficiency—*there is no substitute for All-Wheel Drive.*

AUSTIN-WESTERN COMPANY, AURORA, ILLINOIS, U. S. A.

BUILDERS OF ROAD MACHINERY
Austin-Western

Depth Recorder Aids Underwater Surveys

A recording Depth-O-Meter, Model ES-123, is now available from Bludworth Marine, 92 Gold St., New York 7, N. Y. This model is a portable precision depth sounder designed to measure and record, automatically, the exact depth of water beneath a vessel as it proceeds over its course, and to chart the seabed contours for hydrographic observation and bottom navigation, as well. Bludworth says this instrument shows not only the depth but also the nature of the seabottom materials, and is suitable for channel dredging operations, hydrographic surveys, and salvage work.

Recordings are in feet, with three depth ranges: up to 60 feet, 60 to 120 feet, and 120 to 180 feet. It is claimed that the readings are accurate to plus or minus 6 inches, or 1 per cent of the depth, whichever is greater. The system employs supersonic sounding and the depths are permanently recorded.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 3.

Shapers and Lathes

A new 7-inch bench shaper is announced as an addition to its line of lathes and machine tools by the South Bend Lathe Works, 114 E. Madison St., South Bend 22, Ind. This metal working shaper is designed for toolroom and industrial use, and requires a ⅓-hp 1,725-rpm motor for power.

The ram is 18 inches long and its stroke of 0 to 7 inches is adjusted by shifting the rocker-arm shoe. Cutting speed is variable from 3 to 114 feet per minute. The tool head has a 3-inch feed, swivels to any angle, and has a positive lock. The work table is 5-7/16 x 5 x 6 inches deep. Horizontal travel is 9½ inches, vertical travel is 5 inches, and the maximum distance from table to ram is 5½ inches.

The company also announces that it has resumed production of its No. 2-H turret lathe. The post-war model has new improvements and refinements in design, including a turret locking mechanism which will index the turret head within plus or minus 0.0005 inch measured 4 inches from the turret face.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 33.

Heavy Carrier Trailers

A bulletin on Cargo Carrier trailer models is available from Transport Trailers, Inc., P. O. Box 968, Cedar Rapids, Iowa. It covers the Model KS single-rear-axle semi-trailer and the Model KD single-rear-axle full trailer. These trailers are for the transportation of crawler shovels and tractors, road maintainers, bulldozers, rock crushers, general equipment, and construction materials.

The release presents the specifications for both models in 10, 13, 15, 18, and 20-ton capacities. It lists standard and special equipment, drawings of the two models, an illustration of the frame construction, and a description of the features of Cargo Carriers.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 67.

Cushing, Sales Manager

The Hall-Scott Motor Division of ACF-Brill Motors Co. has recently announced the appointment of Fred T. Cushing as Eastern Sales Manager, with headquarters at 62nd and Woodland Ave., Philadelphia, Pa. Mr. Cushing will supervise Hall-Scott engine activities east of the Rocky Mountains and will work with users of Hall-Scott engines in industrial service, construction, truck, and special equipment.

The 1¼-inch-capacity electric MallDrill, Model 540A, has been especially designed for heavy construction and maintenance work.

A New Electric Drill

A new 1¼-inch-capacity electric MallDrill, Model 540A, especially designed for all types of heavy construction and maintenance work, has been announced by the Mall Tool Co., 7743 S.. Chicago Ave., Chicago 19, Ill. The drill can be used for drilling metal and wood, driving lag screws, and running nuts.

It features a heavy-duty universal motor, available for 115 or 230-volt ac or dc current. Optional equipment for the drill includes a ⅝-inch Jacobs chuck, a slip clutch that can be set for predetermined pressure, and socket wrenches from ⅞ to 1½-inch capacities.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 55.

Hydraulic Loader

A heavy-duty front-end hydraulic loader with a third-cylinder arm for operation of equipment is fabricated by A. F. Wagner Iron Works, 1905 S. First St., Milwaukee 1, Wis. This loader is a multi-purpose unit which may be mounted on almost any make of tractor to expand its use. The company lists a few of the suggested attachments for the loader: a material bucket, crane lift, backfill blade, utility platform, post driver, snow plow, snow bucket, and fork lift.

The loader is a package unit, including a hydraulic system; power is developed from a hydraulic pump which is driven from the front end of the tractor crankshaft by means of a coupling. The hydraulic system is controlled by means of a valve and oil lines which operate the two cylinders for raising and lowering the loader; a second valve controls the third cylinder which operates the equipment. The unit is said to lift a load of 1,500 pounds in 7 seconds and lower it in 5 seconds.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 68.

Winches for All Vehicles

A catalog on the line of Ramsey winches for all types of vehicles has recently been issued by Ramsey Winch Mfg. Co., P. O. Box 3035, Tulsa 8, Okla. These winches are designed for mounting on passenger cars, pick-ups, Jeeps, trucks, and tractors.

The folders, each for a particular type of vehicle, display pictures of the winches in position, and list the specifications. The winches are available in front-mounted or rear-mounted models; there is also an aluminum front-end winch if desired. For the Jeep a bed-mount winch may be obtained. The literature points out that the winch kits are not interchangeable and the make and model need to be specified. Data are also offered on the Ramsey hand winch. The company claims that an average man can lift 1,000 pounds with the Model 10 hand winch.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 47.

Hoisting Regulators For Excavator Units

Improved hoisting regulators for use with electrically controlled excavators are announced by the Westinghouse Electric Corp., 306 Fourth Ave., Pittsburgh 30, Pa. In order to develop a faster hoist motion without overloading the hoist motor, Westinghouse has added another field to the Rototrol rotating regulator. This was accomplished by changing two coils of the hoist generator and by changing some of the control elements.

According to Westinghouse, raising the voltage of the hoist generator does not cause excessive heat to develop. The new field provides a wider range of voltage control at no load (from 100 to 600 volts instead of the previous 450 to 600) and gives better and more precise control under light-load conditions.

Another problem was to increase power in the hoisting direction but not in the lowering direction, so that the overhauling load would not exceed the capabilities of the rotating equipment. This was accomplished by using the directive characteristics of the Rectox rectifier, connected in parallel with part of the hoist-generator field resistance. To change the direction of the hoist motion, the generator field current is reversed. During hoisting, the rectifier is said to act like a short circuit; during lowering, like an open circuit. In the hoisting direction, part of the field resistance is short-circuited and the generator delivers more power than in the lowering direction, Westinghouse states. The company recommends a rectifier rather than a contactor for such operations because it has no moving parts and requires no maintenance.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 110.

Jay Downer Dies at 72

Jay Downer, of Larchmont, N.Y., died recently in a New Rochelle hospital. He had a long list of engineering achievements, among them the Westchester County parkway network. His firm, Downer, Green & Carrillo, had for the City of New York the design and supervision of construction of Idlewild, the world's largest commercial airport.

Adams *Motor Graders*

Built Stronger for Tough Work

Rough, tough grading jobs don't bother the owners of Adams Motor Graders. These powerful, husky machines are built with an extra measure of strength and stamina, through and through—have an abundance of everything it takes for handling the most punishing work . . . for punching shale out of hillsides—making heavy ditch and bank cuts—scarifying hard surface material—bucking through deep snow drifts, etc. What's more, with 7 distinct models to choose from, there's an Adams Motor Grader with the *right power* and *right capacity* to meet individual needs exactly.

Designed Better for Fast Servicing

To save you time and money, Adams Motor Graders are designed for exceptionally fast, easy servicing — *built to spend fewer hours in the shop — more hours on the job.* Note how these usually difficult major repairs are accomplished in minimum time, with minimum effort:

- **Rear Axle** is the full-floating, two-section type—either section is easily replaced without removing the tandem drive.
- **Clutch** is conveniently located between cab and engine—is reached merely by laying back the fuel tank and removing the clutch housing cover plate.
- **Transmission** rides on the tandem drive—is readily reached by disconnecting and backing out the final drive assembly. This operation also exposes entire under half of the engine for easy servicing.
- **Engine** is mounted on top of the transmission housing—may be completely removed from the chassis simply by making a few disconnections at the radiator and clutch.

Let your near-by dealer show you how Adams Motor Graders save you time and money—*on the job and in the shop.*

J. D. ADAMS MANUFACTURING CO. • INDIANAPOLIS, INDIANA

A Professional Guide For Junior Engineers

"A Professional Guide for Junior Engineers", the work of the late Dr. William E. Wickenden, for eighteen years President of Case Institute of Technology, has just been published by the Engineers' Council for Professional Development. G. Ross Henninger, Director of Publications of the Illuminating Engineering Society, undertook the task of editing the final version after Dr. Wickenden's death in 1947.

The book presents the philosophy and engineering ethics a young engineer needs for success, as viewed by the author. It opens with a historical survey of the engineer's heritage and the beginnings of engineering societies. From there Dr. Wickenden traces the engineering profession through its every aspect: what the young engineer may expect to find, the difference between a trade and a profession, and professional relationships. The book ends with Dr. Wickenden's most famous essay on a philosophy of life, "The Second Mile", known to engineers the world over.

Addenda to the book are "Faith of the Engineer", a credo accepted by the ECPD; a recommended reading list for junior engineers; a self-appraisal questionnaire; and the "Canons of Ethics for Engineers".

Copies may be obtained from the Engineer's Council for Professional Development, 29 W. 39th St., New York 18, N. Y., for $1.00. Quantity purchases are available at a discount.

Literature on Clutch Plates, Facing and Brake Linings,

A number of folders on the Velvetouch all-metal clutch facings and brake linings are available from The S. K. Wellman Co., 1374 E. 51st St., Cleveland 3, Ohio. The folders cover all of the company's line of clutch plates, facings, and brake linings for a wide variety of automotive, tractor, and industrial equipment. They describe the features of the products, their applications, and complete specifications. The folders, which are fully illustrated, also tell where the company's warehouse centers are located.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 113.

The Frohring Model FF5 Redi-Mixer is a 5-cubic-foot ¼-bag concrete mixer designed for use with Ford, Ford Ferguson, or Ferguson tractors—or tractors with similar rear linkage and hydraulic lifts.

Small-Size Mixers

Two trailer-type tilting concrete mixers are manufactured by the R. L. Frohring Machine Co., P. O. Box 144, Chagrin Falls, Ohio. The first Redi-Mixer, shown in the accompanying photo, is the Model FF5, a 5-cubic-foot ½-bag mixer designed for use with Ford, Ford Ferguson, or Ferguson tractors, or tractors with similar rear linkage and hydraulic lifts. The Model UT5PT 5-cubic-foot Redi-Mixer will operate from any power-take-off tractor.

The company also manufactures 12 additional models in 3 and 5-cubic-foot sizes, portable and stationary, for a variety of uses. They are made to operate from tractor power take-off or flat-belt pulley, electric motors, or gasoline engines.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 19.

Solar Ephemeris, 1949

Copies of "Solar Ephemeris for 1949," published by Keuffel & Esser Co., Adams and Third Sts., Hoboken, N.J., are now available from the company. The ephemeris covers the principles upon which celestial observations are based and the method for determining a true bearing and latitude. This edition includes the new material which first appeared in 1948 and continues the chapters and tables familiar to the users of this book. For observations in latitudes where Polaris cannot be sighted, and for other special observations, a supplement is included.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 83.

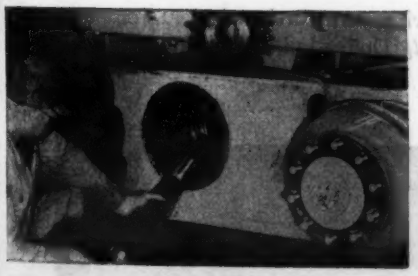
Industry Safety Clothing

Literature on safety clothing is available from the Industrial Gloves Co., 700 Garfield Blvd., Danville, Ill. It includes insert sheets on Steel-Grip protective gloves, chrome leather mittens, hand pads, finger guards, and arm protectors. A 20-page three-color bulletin titled "Safety Clothing for Industry" lists all the company's types and kinds of safety apparel for the worker. A price list is also available.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 20.

New Pittsburgh Office

The Homelite Corp., Port Chester, N. Y., announces the opening of a new branch office at 810 Ridge Ave., Pittsburgh 12, Pa., to cover western Pennsylvania, West Virginia, and eastern Ohio. This new office, opened June 1, takes over the territory formerly covered by Koontz Equipment Corp., Pittsburgh, Pa. William Livingston, a salesman for the company since 1938 and after his discharge from the Air Force, is in charge of the new office.



REAR AXLE is replaced by one man in 2 to 4 hours.

CLUTCH overhaul requires one man 4 hours or less.

TRANSMISSION can be removed by two men in 2½ hours or less.

ENGINE is removed by two men in 3 hours or less.

Make your next motor grader an Adams

Earth Dam Under Way To Curb River Floods

First Year's Work Includes General Excavation Around Site, and Construction of Concrete Outlet Conduit

By WILLIAM H. QUIRK,
Eastern Editor

✦ WHEN the earth dam now under construction near West Peterborough, N. H., is completed, the threat of floods along the Merrimack River will be lessened. The Merrimack, one of New England's industrially important rivers, flows past several large mill cities in southern New Hampshire and northeastern Massachusetts before it meets the Atlantic Ocean at Newburyport, Mass. A flood on this river, in the light of past experiences, results in a financial loss from both property damage and lost time through unemployment caused by closing of the mills.

The West Peterborough Dam is not on the Merrimack River, but on Nubanusit Brook, one of its tributaries. Nubanusit Brook empties into the Contoocook River, which in turn joins the Merrimack River at Penacook, N. H. The Contoocook River is one of the few rivers in this section of New England that flows in a northerly direction.

Located in southern New Hampshire in Hillsborough County, the new dam is a Merrimack Valley flood-control project of the Corps of Engineers, U. S. Army, New England Division. A contract for its construction was awarded to the M. DeMatteo Construction Co., Inc., of Quincy, Mass., on its low bid of $1,167,355. Construction got under way in April, 1948, and the job is scheduled for completion late this year. The major operations during the 1948 season included general excavation around the site for the outlet works and the spillway, together with the construction of the reinforced-concrete outlet conduit. This year Nubanusit Brook will be diverted through the conduit structure and outlet works by building an upstream cofferdam. A downstream cofferdam will also be thrown up, and the earth fill for the dam itself will be placed between the two cofferdams.

Earth Dam

The dam lies about ½ mile north of West Peterborough which is on State Route 101. At the dam site Nubanusit Brook flows nearly due south through a narrow valley rimmed by hills averaging 1,000 elevation along the top. A slight degree of control is exerted on the brook by the Verney Mills dam, a concrete structure 260 feet wide with a spillway crest elevation of 909.6. This dam forms a small pool to deliver water through a steel penstock to the rayon-processing mill just north of town. This industrial dam is approximately 1,000 feet below the axis of the new flood-control earth-fill dam.

The existing channel of Nubanusit Brook flows through the valley at about the center of the new dam, which will be 1,032 feet long measured from the center of the rotary turn-around drive on the right bank to the abutment on the left or east bank. It will have a maximum width through the base of 280 feet, and a maximum height of about 60 feet above the valley floor. The top of the dam at elevation 967.0 will be 25 feet wide to accommodate an 18-foot bituminous-macadam road consisting of a 3-inch pavement on a 12-inch gravel base. Excavation at the dam site includes a core trench along the center-line axis dug to sound rock, with a 15-foot width at the bottom and a maximum depth of 20 feet. The bedrock is sealed with grout pumped into holes drilled 20 feet deep into the rock bottom, and spaced 10 feet on centers along the center line of the trench. Side slopes of the core trench are 1½ to 1.

C. & E. M. Photo
This view from the right bank of the dam at West Peterborough, looking upstream along the outlet channel, shows a D8 dozer in the foreground and a Northwest 1¼-yard shovel digging in a cut section. In the right background is the concrete batch plant.

Directly above the core trench, the dam will be built up with a core of compacted impervious fill to elevation 962.0 or 5 feet below the top of the dam. The impervious material will be 15 feet in width at the top of the section with 1 on 3 side slopes. Adjoining this impervi-

(*Continued on next page*)

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C. & E. M. Photos

In the spillway section of the West Peterborough, N.H., dam, a Northwest 2½-yard shovel (above) loads a 10-yard end-dump Euclid. At right, workmen build forms for a transition section of the concrete conduit.

ous core on the downstream side is a strip of compacted random fill. This section extends from the top of the impervious material to the base of the dam on a 1.25 to 1 slope. The rest of the dam, on both the downstream and upstream faces, is compacted pervious fill. On the downstream side the slope is 2 to 1, while the upstream side is flatter with a 2.75 to 1 slope.

The upstream face of the dam will be protected from wash and erosion with a 3-foot thick blanket of dumped rock. The downstream toe will be similarly protected with a strip of dumped rock, 3 feet thick, and extending 15 feet up from the bottom of the slope and 5 feet out.

Diversion Channel

One of the initial construction operations on the project was digging a diversion channel into the right bank of the brook. This permanent channel, a reinforced-concrete conduit under the earth dam, will carry the normal flow of the brook and will be the controlled outlet through which impounded floodwaters will be released. The excavation for the channel was all open cut and mostly through ledge; the right side of the valley floor is of schist that drops off sharply in the center, leaving a thicker layer of earth on the left bank. Upstream of the conduit is the open intake channel, 173 feet long, while below the structure is a stilling basin and a 400-foot outlet channel. The outlet channel, with dumped rock along its 1 on 2 side slopes, rejoins the brook below the downstream cofferdam.

The total length of the intake structure is approximately 345 feet, including 32 feet of gatehouse at the upstream end, and a stilling basin 77 feet long at the downstream end. The conduit proper has a 7 x 7-foot cross section with walls 2 feet thick. The gatehouse, from which the flow of water through the conduit is controlled, will be a brick structure built above the concrete tunnel. The 21-foot-wide intake channel is narrowed down at the conduit to enter a transition section, 18 feet 8 inches long, with a 10-foot 10-inch width at the upstream end and tapering down to the regular 7 x 7-foot section.

At the outlet end of the conduit is the stilling basin, 77 feet long and flaring out to a 25-foot width; with a series

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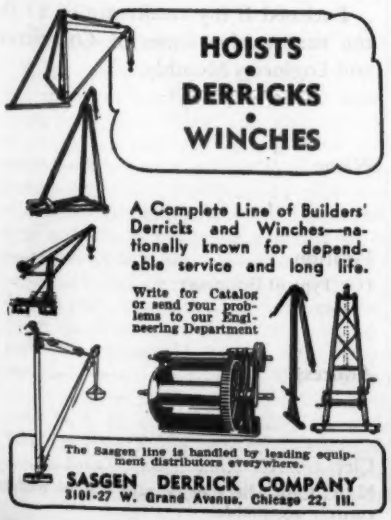

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Earth Dam Under Way To Curb River Floods

(*Continued from preceding page*)

of staggered concrete baffles 3 feet in height.

The concrete conduit was poured in alternate 13-foot monoliths, with a Gates rubber water-stop at the end of each section. The rubber stop is ⅜ inch thick and 9 inches wide, and completely encircles the conduit section. In building the wooden forms for the conduit, the contractor erected special wooden frameworks at 13-foot intervals to support these rubber stops.

Spillway

While the dam itself is located in the Town of Peterborough, the spillway is 4 miles above or to the north of the dam in the Town of Hancock. The spillway is an open channel about 5,000 feet long running from Halfmoon Pond to Ferguson Brook, which in turn empties into the Contoocook River.

The spillway channel is 150 feet wide at the top, with 2 to 1 side slopes. At stations 20, 27, and 29; it is 98, 96.80, and 60 feet wide respectively. At stations 47 plus 50 and 49 plus 50, it is 50 and 23½ feet wide respectively. The average depth is 20 feet, but in one section the maximum cut was 40 feet. Most of the excavation was in dirt, but some granite ledge was also encountered. About halfway down the spillway in a ledge section a concrete ogee-type weir will be constructed 5 feet in height. The crest of the spillway weir will be at elevation 946.0—21 lower than the earth dam.

Excavation at the spillway, as well as at the dam site, included a mixture of topsoil, gravel, sand, silt, clay, cobblestones, boulders, and rock. As the material was excavated during 1948, it was stockpiled in part and part wasted. Last spring the material that was saved, totaling about 10,000 yards of rock and 25,000 yards of dirt, was hauled an average of 4 miles to the dam site for use in the embankment.

Roads and Bridges

In connection with this flood-control project, the Old Harrisville Road, running north from State Route 101 along the left bank of Nubanusit Brook, is to be abandoned in part since it will be blocked by the dam. An alternate route is being built which will permit Harrisville Road traffic to circulate by way of Windy Row Road which meets State Route 101 east of West Peterborough. This relocation job was also awarded to the M. DeMatteo Construction Co., Inc., under a separate contract on a low bid of $53,694. This new section, about a mile long, will have a 12-inch gravel base course which will be given a bituminous surface treatment 20 feet wide. Road shoulders are 3 feet wide.

On this road is a bridge known as Swetts Dam bridge, which had a deck at elevation 940.7 which was more than 5 feet below the spillway crest elevation of 946.0. Consequently, to prevent the structure from being flooded during high water, the bridge was raised nearly 9 feet. The structure has two 30-foot 6-inch spans supported on a concrete pier and two abutments, with a superstructure consisting of eight 18-inch WF 47-pound I-beams. The 21-foot deck is of 4-inch timber planks.

The abutments and the pier were enlarged and raised to elevation 946.25. The original beams were placed across the spans on the newly anchored bearing plates, and a new deck was laid to elevation 949.0, or 3 feet above the spillway crest.

C. & E. M. Photo

Standing in front of a Northwest 1½-yard shovel, H. B. Frederickson, Resident Engineer at the start of the work, and Superintendent John J. Scheuren, Jr.

Construction Program

An early operation at the job site was the development of a road up the left bank of the brook for access to the utility area and the top of the dam. This road has been rough-graded. When completed, it will be of bituminous macadam, 16 feet wide, until it reaches the top of dam where it widens to 18 feet. At the abutment on the right bank the road ends in a rotary with a 60-foot radius. Other buildings at the left abutment include a pump chamber, operator's quarters, a garage, and utility building.

The contractor also built a work

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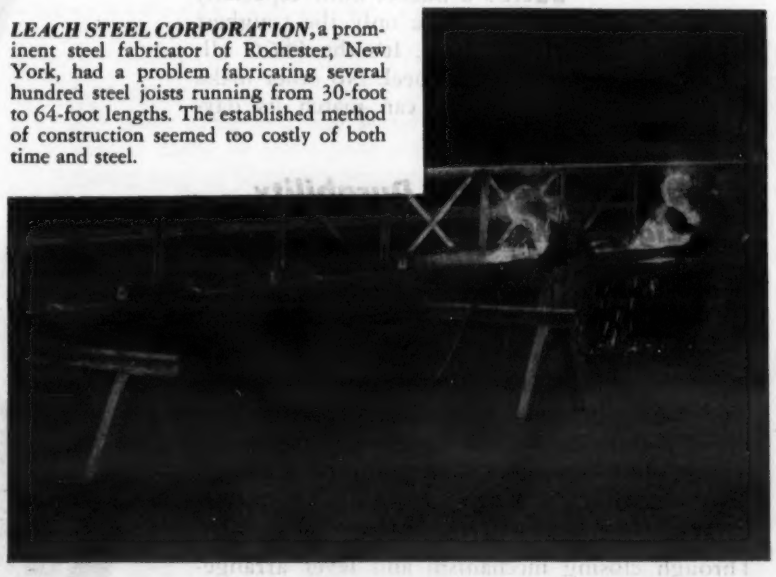
Arc welding helps cut fabricating costs of long span joists



LEACH STEEL CORPORATION, a prominent steel fabricator of Rochester, New York, had a problem fabricating several hundred steel joists running from 30-foot to 64-foot lengths. The established method of construction seemed too costly of both time and steel.

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bridge across the brook upstream of the dam, at a point where the land jutted out from the left bank narrowing the span down to 75 feet. The bridge consisted of two abutments and two piers of log cribs filled with rock and spanned with log stringers. A deck of 4 x 8's was then laid across the stringers, and covered with an 8-inch layer of dirt that was held in place by log guardrails along the sides of the 25-foot roadway. A timber railing was also erected at the sides of the bridge. This bridge was built to take the heavy loads of earth-moving equipment that were filled with material from the conduit excavation on the right bank. Some of this dirt and rock was hauled to the left bank and stockpiled for use when needed.

Material from the diversion-channel cut was set aside to construct the upstream and downstream cofferdams. The latter will be built to elevation 915.0, and the upstream cofferdam to elevation 918.0. The center line of the upstream cofferdam is about 220 feet above the axis of the dam, and has a crown width of 25 feet. Its upstream face will be covered with 5 feet of dumped rock. Impervious material for the center core of the dam itself was taken from both the conduit and spillway cuts, and stockpiled until it was ready to be placed. Pervious material is obtainable around the job site within short hauling distance of the dam. With the exception of the haul from the spillway, the other hauls around the dam itself are short.

Water for the Mill

The Verney Mills below the dam site used the waters of Nubanusit Brook, which were backed up behind its concrete dam, in the processing of rayon. This water had to be clean, but with the heavy construction going on along the right bank of the brook, and muddy water being pumped from the conduit cut back into the brook, such was not the case. The mill had to get water from the brook above the construction scene where it was still clean.

At first the contractor thought of running an 8-inch pipe line upstream along the left bank of the brook, and hooking a couple of pumps to the inlet end which would be well above the construction operations. Clean water would be obtained, but maintenance costs would be high in caring for the pumps during a 16-hour operating day which the mills required. This undesirable feature was overcome by installing 2,700 feet of 18-inch Berger corrugated-metal pipe from the mill right up to clear water above the job site, and letting the water flow through the pipe by gravity, thus eliminating the need for pumping.

The pipe came in 20-foot sections, and the first 1,250 linear feet was carried along the penstock from the mill to the concrete dam. Then a diver went down beneath the waters and passed the pipe through the dam via a 4 x 4-foot sluice gate. The remaining 1,450 feet of pipe was laid on the bottom of the brook by means of a barge, to a point above the work bridge where the water was calm and clean.

Construction Equipment

Rock work was handled by two Worthington wagon drills for the blast holes and line drilling, and also by five Worthington jackhammers. Air for the wagon drills was supplied by two large compressors—a Worthington 500-cfm and a Jaeger 600-cfm—which pumped into a 1,000-foot pipe line acting as a receiver. Of this line 700 feet was 4-inch pipe, and the remaining 300 feet was 6-inch pipe. The jackhammers operated from three smaller 105-cfm compressors—two Ingersoll-Rands and a Joy. In the deep rock cuts the wagon drills were furnished with 1¼-inch drill steel in 6, 12, and 18-foot lengths, with Timken detachable bits from 2⅝-inch down to 1⅞-inch. Both Hercules and American 40 per cent dynamite were used with split-second delays.

For excavating, three Northwest shovels were used—one 2½-yard and two 1½-yard models. The rock was usually moved in four 10-yard end-dump Euclids, and the dirt in four 15-yard bottom-dump Euclids. In addition to this earth-moving equipment, a fleet of eight 6½-yard trucks, hired by the hour, also saw service. Three Caterpillar D2 tractor-dozers worked with the shovels in the cuts.

In preparing the diversion channel for the concrete conduit construction, two Gorman-Rupp 6-inch pumps, a Jaeger 2-inch pump, and a Gardner-Denver air pump, were used to pump the holes dry. Forms were built in 7 x 15-foot panel sections for the 13-foot monoliths, the lumber being cut on a 12-inch circular saw. One-inch boards were used, backed with 2 x 6 studs on 16-inch centers, and double 2 x 6 wales on an average of 30-inch centers. Richmond Tyscrus, also on an average of 30-inch centers, held the opposite form panels together. Reinforcing steel was supplied by the Truscon Steel Co. and delivered from Boston to the job by truck.

Concrete Batch Plant

A concrete batch plant was set up on a sidehill near the dam on the left bank of the brook. The plant belongs to Arthur Whitcomb of Keene, N. H., who subcontracted to supply the concrete for the job and to deliver it to the forms. An Erie 105-ton AggreMeter plant was erected to receive the sand and gravel that was trucked to the job from the subcontractor's gravel plant in Keene, 20 miles away. The trucks dumped the aggregate from a ramp into a materials hopper, and from there it was raised to the AggreMeter on a 50-foot conveyor belt. This set-up eliminated the need of a crane at the plant.

A cement shed was also built into the side of the hill alongside the aggregate bin for storing Lehigh and Ironclad cement in paper bags. All concrete on the job was mixed in three Jaeger 3½-yard truck-mixers mounted on International trucks. The truck-mixers backed under the AggreMeter first to get loaded with sand and gravel, then moved along to the adjoining shed for a load of cement. The bags were emp-

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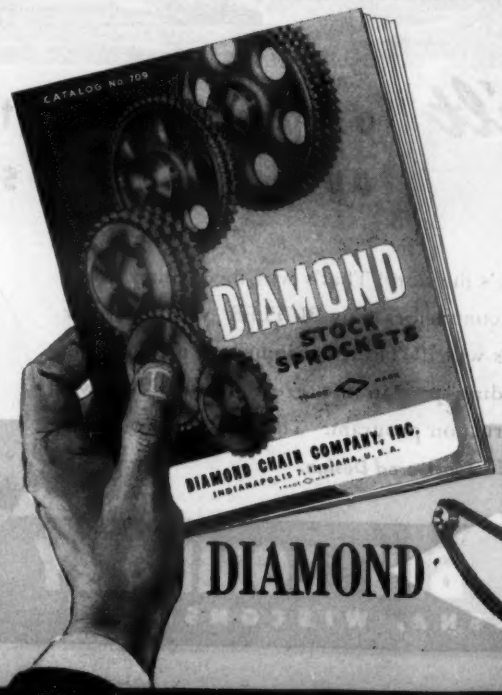

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Earth Dam Under Way To Curb River Floods

(*Continued from preceding page*)

tied into a hopper at the bottom of which was a canvas sock which fed the cement directly into the mixers. Water was also picked up here, it having been pumped from the brook to a supply tank.

The concrete was placed in the forms from the truck-mixers by a Bucyrus-Erie Model 22-B ¾-yard crane equipped with a 40-foot boom and a 1-cubic-yard concrete bucket. And as it was placed, the concrete was vibrated with Mall and White vibrators. The concrete was cured with water.

Quantities and Personnel

The major items on the $1,167,355 dam contract include the following:

Common excavation	473,000 cu. yds.
Pervious borrow	140,000 cu. yds.
Rock excavation, dam	5,300 cu. yds.
Rock excavation, spillway	29,000 cu. yds.
Pervious fill	96,700 cu. yds.
Random fill	45,300 cu. yds.
Impervious fill	43,300 cu. yds.
Sand and gravel fill	19,700 cu. yds.
Dumped rock	36,280 cu. yds.
Concrete	4,090 cu. yds.
Cement	6,000 bbls.
Steel reinforcement	225,000 lbs.

The major items on the $58,194 road contract are as follows:

Earth excavation	14,400 cu. yds.
Rock excavation	1,000 cu. yds.
Gravel base course	6,100 cu. yds.
Bituminous surface treatment	7,700 gals.
Concrete	290 cu. yds.

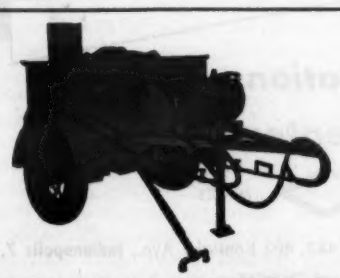
M. DeMatteo Construction Co., Inc., is employing a force of between 50 and 60 men on the job. The preliminary phases of the work were under the direction of John J. Scheuren, Jr., as Superintendent. The present Superintendent is John Ryan.

The New England Division is headed by Col. James H. Stratton. The Assistant Division Engineer is Lt. Col. G. N. Carlson. Chief of the Operations and Construction Division is C. J. Murray.

A Sawhorse Bracket

A new bracket has been devised to make the setting up and taking down of sawhorses easy. Called the Jiffy sawhorse bracket, it is manufactured by Grand Haven Stamped Products Co., Grand Haven, Mich. The brackets require no nails or bolts, and are used with ordinary 2 x 4-inch legs and 2 x 4, 6, 8, 10, or 12-inch crossbars. The Jiffy brackets make it easy and convenient to knock down and store sawhorses, says the manufacturer.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 133.



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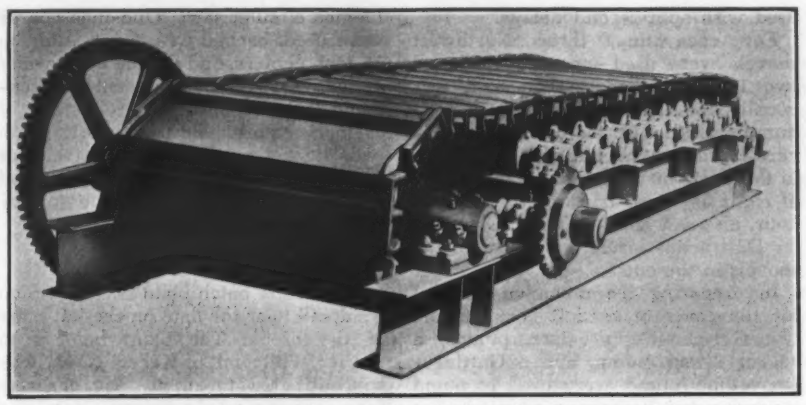

Designed for any breaker requiring a feeder which can handle up to 50-inch material, the New Holland Model 50 apron feeder has a 28-ton hopper capacity.

Large Apron Feeder

A Model 50 apron feeder with a 28-ton hopper capacity is now being made by the New Holland Mfg. Co., Mountville, Pa. It is designed for any breaker requiring a feeder which can handle up to 50-inch material. The model weighs 39,475 pounds, including a standard steel hopper made of 1-inch plate. Special hoppers are available on request.

The feeder is 50 inches wide and has a 14-foot 6-inch center-to-center length. Manganese-steel pans, weighing 371 pounds, are 50 inches wide and have a pitch of 9 inches. Head sprocket and tail wheel are made of 12-inch-pitch-diameter carbon steel. The sprocket has renewable manganese teeth and the tail wheel has renewable manganese pads. Rollers are manganese and the drive gear and pinion have cast teeth. The main frame is 18 feet 6 inches long.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 29.

Steel-Plant Celebration

Joseph T. Ryerson & Son, Inc., steel distributor, recently held open house at its Philadelphia, Pa., steel-service plant. This was in celebration of the formal opening of the new larger plant and office building. About 2,800 customers and friends of the firm visited the plant on one day, and employees and their families, numbering about 500, were entertained by the management on the following day.

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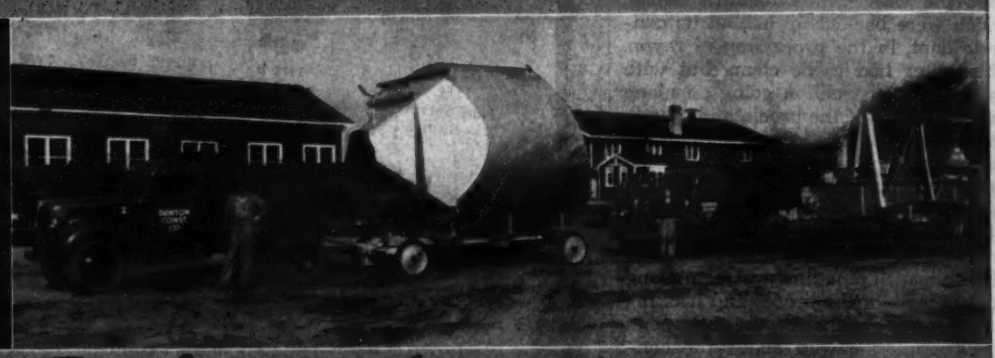

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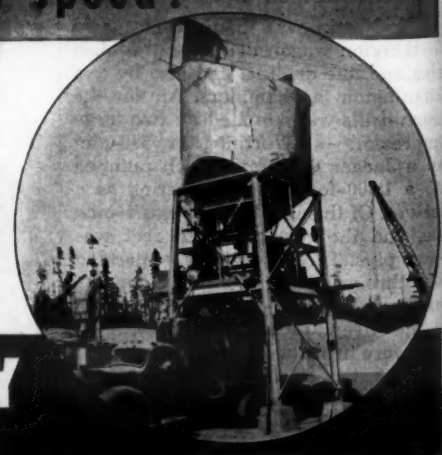


BUTLER BIN COMPANY
WAUKESHA, WISCONSIN

Hydraulic Units Fit Track-Type Tractors

It has been recently announced by Athey Products Corp., 5631 W. 65th St., Chicago 38, Ill., that Athey hydraulic pump units for operation of Forged-Trak dump trailers are now adaptable to all makes of track-type tractors. This will enable tractor owners who so desire to equip their machines with the hydraulic units especially designed for use with Athey track-type earth and rock-moving trailers.

The company claims that the Athey hydraulic pump unit provides smooth, positive control of dumping operations, allowing Athey trailers to be side-dumped with a high degree of accuracy, either when stationary or while moving. Controls for the hydraulic system are located near the tractor operator, ready for quick spotting of loads.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 73.

Eye, Nose, and Throat Protection Devices

Safety equipment for protecting the eyes, nose, and throat is manufactured by the General Scientific Equipment Co., 2700 W. Huntingdon St., Philadelphia 32, Pa. This equipment includes a plastic-shield protective mask with replaceable filters, a lightweight dust hood with a large plastic window, a face shield for welders and woodworkers, and head-rest goggles.

The G-S masks are designed to protect the throat, nose, and bronchial tubes from particles of non-toxic dusts. They weigh less than ½ ounce and are recommended by the manufacturer for use in cement plants, machine shops, and other places where fine dusts are present. The G-S dust hood is a garment designed to fit loosely over the head and shoulders. It can be used with corrective glasses or a respirator, the company reports.

The Type J-1 face shield is made of extruded plastic and is fitted with a sweat band and pivot assembly. It is available with visors in three thicknesses, in three shades of green, and with three depths. The visors are 11 inches wide and have wire-reinforced gimp binding. The No. W-50 head-rest goggles have standard 50-mm-size lenses in shades from 3 through 6, held in individual eye cups. Cover glasses are designed to protect the filter lenses from pitting. The head-rest attachment is said to distribute the weight of the lenses over the entire head. Other features include a sweat band, goggle assembly with telescoping arms, concealed springs to hold the goggles gently against the face, and eye cups with ventilating screen and baffle plate to prevent fogging and to eliminate stray light.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 91.

The Athey hydraulic pump units for operation of Forged-Trak dump trailers are now adaptable to all makes of track-type tractors.

Lock for End Gates

A lock for truck end gates is made by the Engalo Mfg. Co., McPherson, Kans. It is designed to keep the end gate closed tight against the steel box of the truck, to do away with outside braces, and to keep the box from spreading. The manufacturer points out that the Perrin lock will not interfere with the use of the end gate or with the chain used to hold the gate horizontal.

The Perrin device is self-locking and features an over-center linkage said to hold the lock tighter as the strain increases. It is designed to open or close with one pull or push. The unit is available in a complete kit for installation on all makes of new or old trucks.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 69.

New Plant for Lincoln

The Lincoln Electric Co., Cleveland, Ohio, has recently completed final arrangements with the Austin Co. of Cleveland for the immediate construction of an $8,500,000 plant to be erected in Euclid, Ohio. The one-story manufacturing plant will contain over 850,000 square feet of floor area on a 65-acre site on St. Clair Avenue between East 222nd Street and Babbitt Road. The new plant will be ready in 1950 for the transfer of all manufacturing operations from the present plant.

FOR SECONDARY ROAD CONSTRUCTION...
ARIENS AGGMIXER

The swirling, chopping action of these tines does a thorough job of mixing, wet or dry.

HERE'S equipment designed especially for mixed-in-place construction—to operate in connection with other general purpose equipment. Whatever aggregates are used it thoroughly pulverizes, mixes and aerates aggregates with binder—rapidly and economically. Also ideal for soil cement stabilization. Safe . . . made 4 standard sizes, 4', 5', 6' and 7'. Write for details.

ARIENS COMPANY BRILLION WISCONSIN

New
UNIT 1520
Self-Propelled
RUBBER-TIRED
CRANE

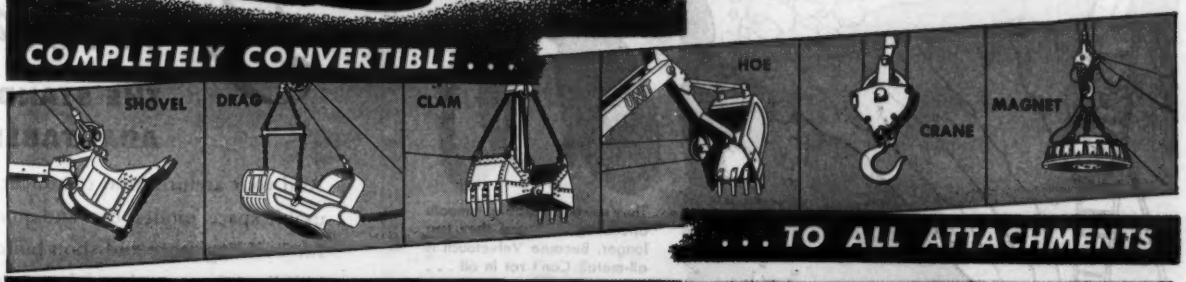
15 TON CAPACITY

This 50,000 pound Mobile Crane is a completely new member of the UNIT Crane and Shovel line. Designed for both "on and off" highway operation. So compact, it works efficiently even in small, cramped quarters, "in or out" of the yard.

- Rugged . . . Perfectly Balanced
- Hook Roller Construction
- Controlled and Operated by ONE Man
- Powered by ONE Engine
- Hydraulic Steering . . . Air Brakes and 4 Speed Air-Activated Transmission
- Heavy Duty, yet operated with remarkable SPEED . . . SAFETY . . . ACCURACY . . . ECONOMY!

UNIT CRANE & SHOVEL CORP.
6309 W. BURNHAM STREET
MILWAUKEE 14, WISCONSIN, U. S. A.

COMPLETELY CONVERTIBLE . . .

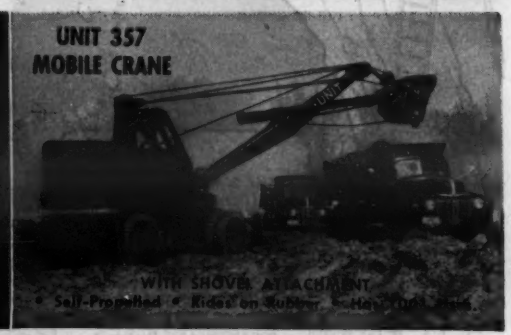


. . . TO ALL ATTACHMENTS

REMOVABLE BUMPERS

Both the UNIT 1520 and 357 Mobile Crane are equipped with removable bumpers.

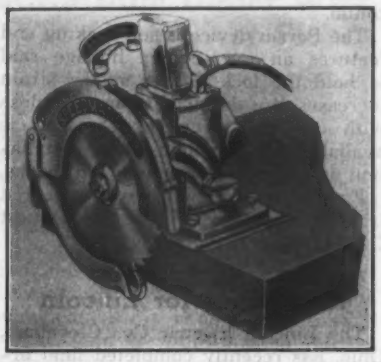
UNIT 357
MOBILE CRANE



WITH SHOVEL ATTACHMENT
• Self-Propelled • Rides on Rubber • Has Front Outriggers

Greater digging efficiency is attained in excavating by removal of one bumper. Permits additional space to lower boom, thus increasing digging depth in trenching or other excavating jobs. Provides close-range operation on shovel work. Bumper is bolted to undercarriage frame and its removal is a simple operation.

SHOVELS • DRAGLINES • CLAMSHELLS • CRANES • TRENCHOES • MAGNETS



The fastest cross-cutting and ripping 8-inch saw ever built by Porter-Cable is the new Type K-89.

A New Electric Saw

The addition of an improved 8-inch electric saw to its line of Speedmatic tools is announced by the Porter-Cable Machine Co., 1714 N. Salina St., Syracuse 8, N. Y. The new saw, Type K-89, features a more powerful motor than previous models and is the fastest cross-cutting and ripping 8-inch saw ever built by Porter-Cable.

It is a medium-weight high-powered one-handed saw for general work. A new Protecto-Wall between the saw and the motor is designed to seal out dust and grit. A helical gear drive delivers the motor power to the cutting blade. The Model K-89 has a fan which draws air through the motor and discharges it at the front to keep the line of work ahead clear of sawdust and visible at all times. An opening in the rear of the blade housing discharges the sawdust.

Specifications are: a 115-volt ac/dc motor; saw speed under load, 4,500 rpm; overall dimensions, 12 inches long, 8⅜ inches wide, and 11½ inches high; and a net weight of 17 pounds. The saw is adjustable for any depth up to 2¾ inches and is graduated for any angle up to 45 degrees. Standard equipment includes a Hammerstone-finish steel carrying case, 10-foot cord and plug, wrenches, and rip gage. Abrasive cutting wheels are also available for work with tile, metal, etc.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 44.

Folder on Terracers, Ditchers, and Graders

A catalog is available on the Martin line of terracers, ditchers, and graders manufactured by Owensboro Ditcher & Grader Co., Inc., Owensboro, Ky. This line is especially adapted to soil-conservation and roadside work.

The folder describes the Martin Ideal terracer which is made in three models with 6, 7, and 8-foot blades; the blades are 12½ inches wide and 5/16 inch thick. It also covers three models of the Martin Hummer, a type similar to the Ideal terracer, and with the same blade sizes, but of a lighter weight.

The Martin two-way flat-bottom ditcher may be obtained in two models, the catalog points out, for cutting ditches 5 or 6 feet wide at the top, 10 or 14 inches wide at the bottom, and 2½ or 3½ feet deep. It has been used for cutting tile and open drainage ditches, but has also proved adaptable in irrigation ditching.

The Model 20 V-type unit discussed in the catalog is available in four styles and has a wide variety of ditching, terracing, and grading uses. All models are adjustable for wide or narrow cut, and, with the exception of the flat-bottom ditchers, all are reversible to throw dirt to either side.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 42.

Double-Duty Welder

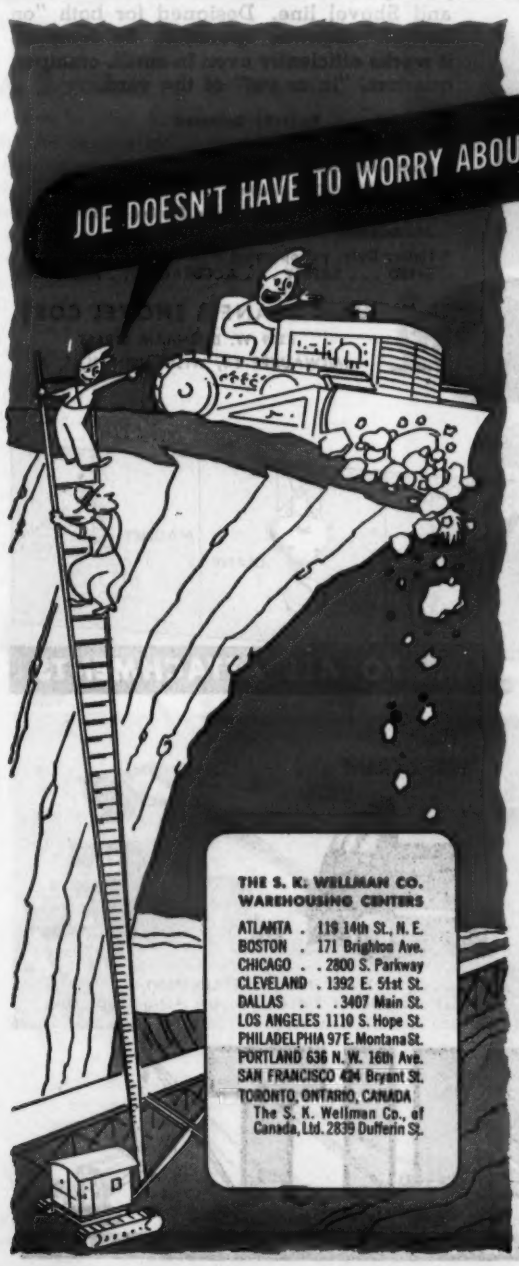
A double-duty welder for use with both light and heavy-gage material is announced by the Eutectic Welding Alloys Corp., 40 Worth St., New York 13, N. Y. The 220-volt EutecArc ac welder features a stepless current control over its entire range of from 20 to 285 amps. According to the manufacturer, operating adjustments are so dependable that small-diameter ac electrodes can be used without fear of waste or damage.

The EutecArc welder has no boosters, stabilizers, or other auxiliary attachments, Eutectic reports. Among the features claimed for it are easy starting, stable arc characteristics, low spatter loss, and shielded off-on switch. It will accommodate electrodes from 1/16 to ¼ inch in diameter, and it has a drip-proof case with natural convection cooling to eliminate the need for fan cooling. The EutecArc measures 17 x 17 x 32 inches and is supplied complete with electrode holder with cables and ground clamps, wall receptacle and plug, power cable, and helmet.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 111.

New Homestead Officers

F. E. Schuchman has been elected President of Homestead Valve Mfg. Co., Coraopolis, Pa. He is also General Manager and Treasurer at the present time. W. R. Schuchman, another son of the company's founder, was named Chairman of the Board after 28 years as President. J. E. Roth, former Board Chairman, was named Chairman of the Advisory Committee. Other officers named were Bradley McCormick, Secretary, and N. E. Kolesar, Assistant Treasurer.


JOE DOESN'T HAVE TO WORRY ABOUT HIS BRAKES . . .
his dozer's equipped with Velvetouch all-metal linings!
They're dependable, smooth operating . . . and they last longer. Because Velvetouch is all-metal! Can't rot in oil . . . or burn like ordinary material. Insist on Velvetouch brake linings, clutch plates, clutch facings, and steering discs . . . and watch your equipment stay out of the shop . . . and on the job!
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FOR BRAKE AND CLUTCH USE
VELVETOUCH
ORIGINAL EQUIPMENT . . . WITH THE LEADERS
THE S. K. WELLMAN CO.
1374 East 51st St., Cleveland 3, Ohio
25 years of service 1924-1949

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ADAPTABLE FOR 1000 USES
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Low Cost. Factory prefabricated without waste of time or material, packaged for quick, easy erection.
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TIMBER STRUCTURES, INC., OF CALIFORNIA — Oakland and Sacramento
Local Representatives Coast to Coast

Wellpoints Dewater River Bridge Piers

Deep Quicksand Becomes Stable as Pumps Unwater Area Beneath 2,600-Foot Canadian River Bridge

By RAYMOND P. DAY,
Western Editor

(*Photo on page* 1)

✦ TWENTY-SIX-FOOT wellpoints on 4-foot centers, connected to a 6-inch suction header and pump, solved a serious unwatering problem in the treacherous Canadian River floor near the Texas Panhandle town of Borger. By using the wellpoint scheme, the contractor was able to unwater five piers at a time and complete his job without a single bad mishap.

John F. Buckner & Sons of Cleburne, Texas, was the contractor, and the job was the new $652,969 Canadian River Bridge on Texas State Highway 117. The job carried the Federal-Aid number of F-1053 (1), and was supervised by District 4 of the Texas Highway Department.

The new 2,600-foot bridge was necessary to replace the obsolete 18-foot-wide steel truss-type bridge which formerly spanned the stream, in line with a general modernization and realignment of Route 117 between Borger and Stinnett. The old bridge, built by Hutchinson County and then turned over to the State, had already caved in twice, once with loss of life. Considering the wide, heavy traffic which now travels this highway, the bridge is not being replaced a minute too soon.

New Piers Deep in Sand

What caused the major unwatering problem was the necessity of designing piers which reached about 18 feet down through the quicksand, and then rested on steel H-beam bearing piles. These piers were spaced at 81-foot 3-inch centers all the way across the Canadian River.

Designed for H-20 44 loading, the new structure is composed of eight 325-foot continuous I-beam units resting on top of the piers. Four longitudinal 36-inch-deep I-beams form the main carrying members, and these are stiffened by other structural-steel pieces. Riveted and welded construction are combined.

The bridge deck is 28 feet wide curb to curb, with a 1½-foot walkway and a low structural-steel guardrail on each side. It is made of reinforced concrete. The concrete deck slopes from the center line to the curbs, with drain scuppers at intervals to carry run-off. The 325-foot concrete deck units have contraction joints over each pier, expansion being taken care of at steel joints with intermeshing fingers at the end of each unit.

Protective Levees Built

Before dewatering with wellpoints began, a system of protective earth dikes was erected upstream from the construction area about 500 feet. This dike system consisted of three earth cofferdams, one behind the other. The Canadian River is a wide, shallow stream, whose currents meander here and there across the stream bottom through a formation of quaky quicksand.

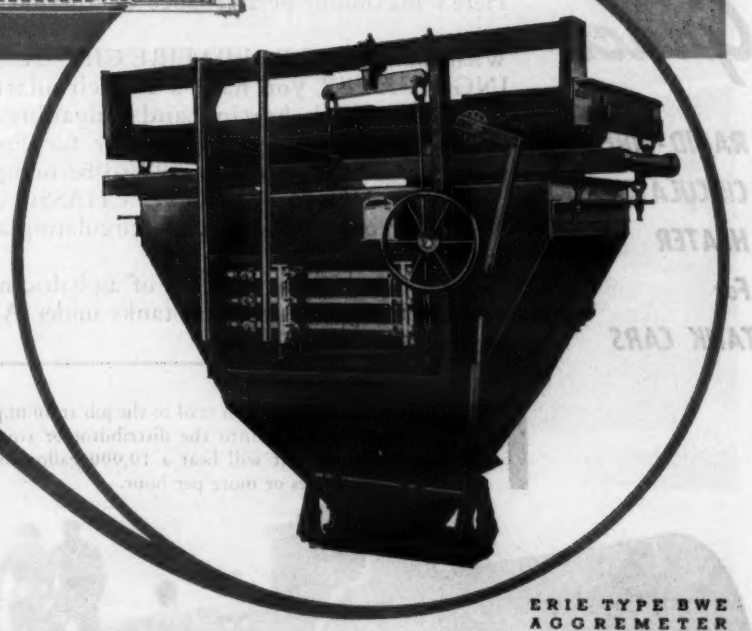
The dikes were erected by a Lorain 41 dragline, working on timber mats. The borrow area for the dike material was so shaped that it would be a channel for any stream flow coming down against the job. Several times in the job the river rose sufficiently to break through two of the dikes, but the third one always held. The only possible exception was a minor break-through of a small tributary creek, which flooded out the first pier. The break was quickly corrected.

(*Continued on next page*)

The new $652,969 Canadian River Bridge in progress on Texas State Highway 117. It replaces the old 18-foot-wide steel truss-type bridge at right.

A knock-down
TRUCK MIXER
or
CENTRAL MIX PLANT

3 or 4 Compartments-in-line combining Aggregate and Cement with Auxiliary Ground Storage Cement Bin.



The heart of the above ERIE CTBS Knock-down Truck Mixer plant is the improved Erie BWE AggreMeter at the right. It is arranged with one compartment for aggregate and one for cement—all controls are located for fast and easy operation. An Erie MB-3 Cement Bin alongside, provides up to 492 bbls. auxiliary cement storage, fed by under track screw conveyor to vertical bucket elevator which directs cement to main plant or auxiliary cement storage. (Type LB-3 Cement Bin offers up to 1025 bbls. of cement storage.) This is just one of scores of Erie Bin Combinations so let's have your aggregate and cement storage and batching problem.

ERIE TYPE BWE AGGREMETER

Which 3 compartment-in-line combining aggregate and cement fits your needs?*

CEMENT GROUND STORAGE		MAIN PLANT*			AGGREMETER
TYPE	CAPACITIES	TYPE	TOT. CAP.	CAPACITY CEMENT COMPARTMENT	TYPE BWE 3 BEAM SCALE
MB-1	172 to 194 bbls.				1 ½ — Cu. Yd.
MB-2	270 to 304 bbls.	CTBS	98 Cu. Yd.	230 to 260 bbls.	2 — Cu. Yd.
MB-3	437 to 492 bbls.	CTBS	118 Cu. Yd.	275 to 308 bbls.	3 — Cu. Yd.
		CTBS	160 Cu. Yd.	330 to 375 bbls.	4 — Cu. Yd.
		CTBS	202 Cu. Yd.	380 to 430 bbls.	5 — Cu. Yd.
					6 — Cu. Yd.

*For 4 Compartments-in-line combining aggregate and cement ask about Erie Type CTES plants and EWE AggreMeters.

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CONCRETE VIBRATORS
MOUNTED ON WHEELBARROW CHASSIS
Write for details and prices
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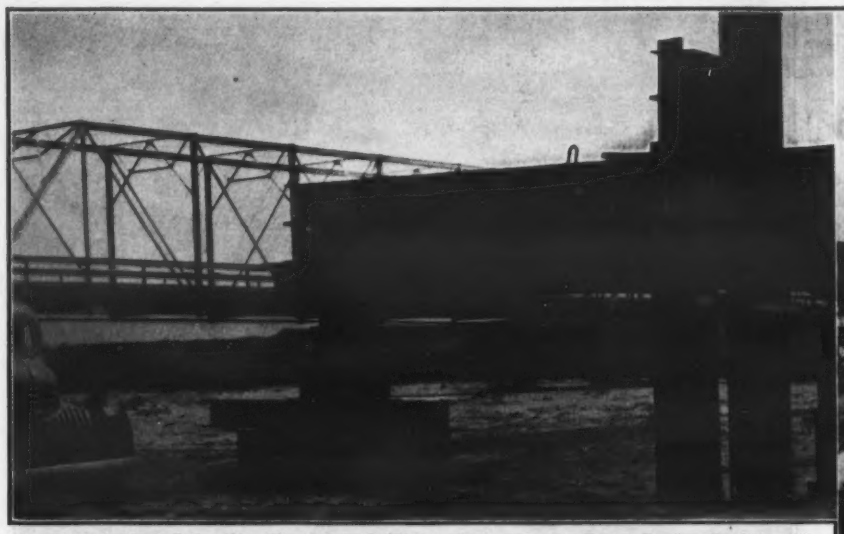
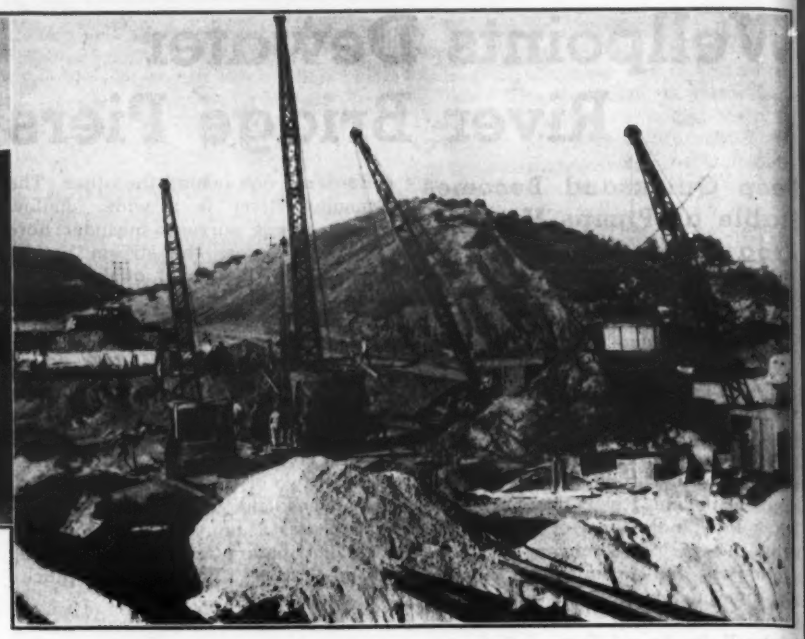




At the beginning of the Canadian River Bridge project, near the Texas Panhandle town of Borger, pile-load tests were taken. In the photo above, two 100-ton jacks pull on two piles and push on one pile. At right, work on piers 31 and 32 is under way for this $652,969 structure on Texas State Highway 117.

Wellpoints Dewater River Bridge Piers

(*Continued from preceding page*)

Construction of the earthen dikes shunted the river water away from the piers, leaving only subsurface water as the main problem.

Wellpoint Dewatering Begins

The wellpoint dewatering system consisted of about 75 per cent Moretrench equipment and the remainder Stang equipment. All pumps were Moretrench. The 26-foot-long wellpoints were started at the south bank of the river by jetting them down to a point about 3 to 4 feet below the riverbed on 4-foot centers; then connecting them to 6-inch suction headers. The headers were so laid out that they formed a rectangle 72 feet 8 inches x 81 feet 3 inches, with a valve at each corner of the rectangle.

This permitted wellpoints and header pipe on the finished side of the work to be moved ahead from time to time as necessary. Pumps were placed every second hole, with the system so arranged that one, two, or three pumps could be used at any one time. The header pipe was placed about 3 to 4

(*Continued on next page*)

TWO UNITS ***ON ONE CHASSIS...***

Grace

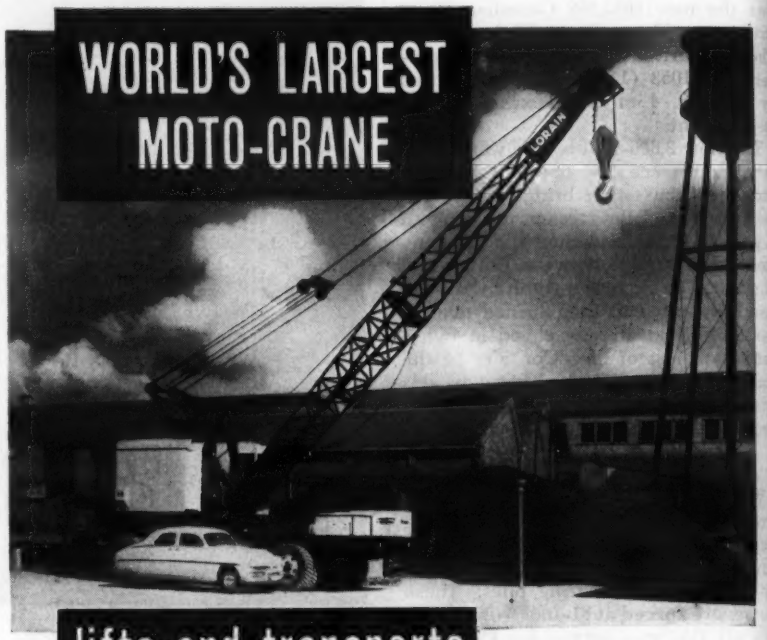
RAPID-FIRE CIRCULATING HEATER For TANK CARS

Here's maximum performance on the job for you.
With the GRACE RAPID FIRE CIRCULATING HEATER you have a fast circulating heater for quick heating and unloading... PLUS the built-in steam generator for emergency thawing of cars too cold to be pumped ... TWO UNITS ON ONE CHASSIS ... Will thaw one tank car while circulating and loading out another.
Designed for heating all types of asphaltic material in tank cars or truck tanks under ALL conditions.

The Rapid-Fire Heater will trail to the job at 40 m.p.h. It will unload asphalt into the distributor or storage tank at 250 GPM. It will heat a 10,000 gallon insulated car 50 degrees or more per hour.

W. E. GRACE MFG. CO.
6007 South Lamar Street • Dallas, Texas

WORLD'S LARGEST MOTO-CRANE



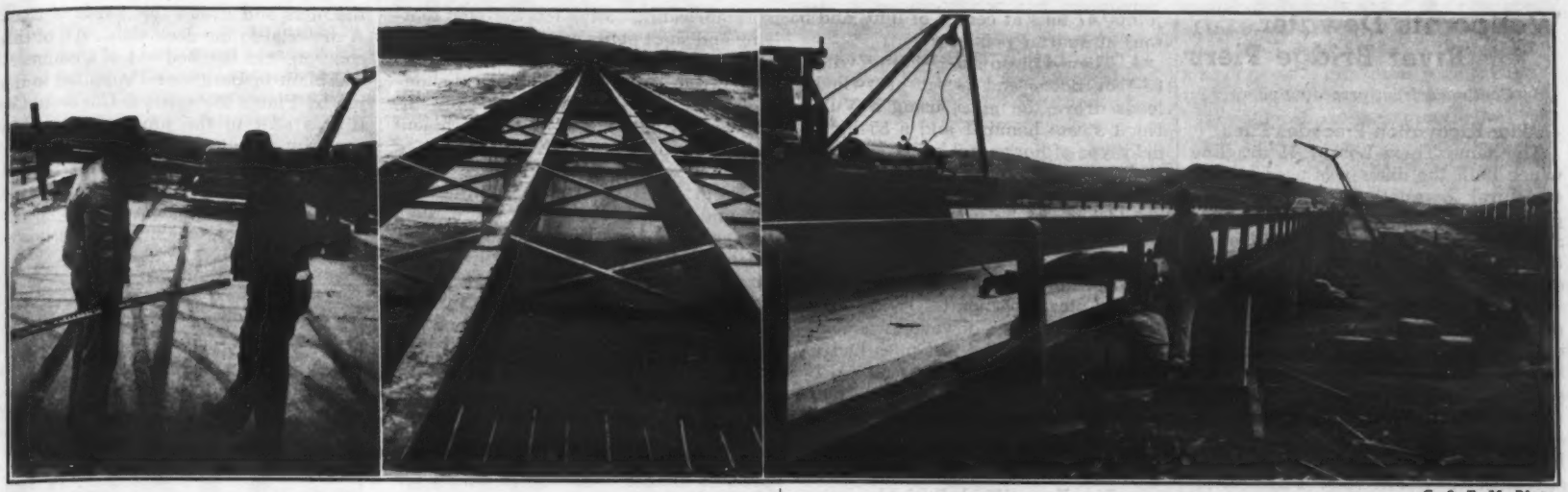
lifts and transports up to 45 Tons with its two WAUKESHA *Diesels*

The Lorain MC-820 Moto-Crane has two WAUKESHA Super-Duty DIESELS (Model WAKD) six cyl., 6¼ x 6½ in., 1197 cu. in. displ. One engine propels the rubber-tired carrier which transports the unit (weight 65 tons) at 18 m.p.h. The second Waukesha Diesel installed in cab of crane (as shown below) powers revolving turntable, hoist, swing and boom derricking; supplying power to lift loads up to 90,000 lb.

● New fields in heavy material handling by mobile equipment, are being opened by this giant, rubber-tired two-engined crane. Said to be the world's largest, the first of these Waukesha-Diesel-powered Lorain MC-820 Moto-Cranes is working in the world's largest steel mill. It has a safe-rated lifting capacity of 45 tons (90,000 lb.) at a 12-ft. radius. Thirty years ago when Thew built the first portable crane—also a Waukesha-powered Lorain—its capacity was only 3½ tons. The latest Lorain's ability to lift and transport far heavier loads than any previous portable crane, extends the basic advantages of the moto-crane for handling heavy material in steel mills, steel erection, ship and bridge building, oil fields, logging and many other industries.

A crane is no better than its engines. With their 30 years of motorized crane experience, Thew Shovel Company engineers chose two big Waukesha Super-Duty Diesels to power the world's largest moto-crane. Waukesha Diesels are winning recognition everywhere as the world's finest power plants of their size and type. Get Bulletin 1415.

WAUKESHA MOTOR COMPANY • WAUKESHA, WIS.
NEW YORK • TULSA • LOS ANGELES



C. & E. M. Photos

Surveyor Lewis (standing at left in the first photo) gets some pointers on the Texas bridge job from General Superintendent B. L. Hale. Both men are hunched up against the cold. The detail view, in the center photo, shows the structural-steel skeleton arrangement of the bridge. And above, crew members set guardrail, as the equipment in the background places concrete. John F. Buckner & Sons of Cleburne, Texas, was the contractor on the job.

feet below the general level of the riverbed, and the pumps were also about on that level.

When the pumps started up, three 8-inch streams of water began to flow out the discharge lines to the river channel ahead of the protective levees. Dewatering proceeded in a completely satisfactory manner.

"Ground that was so shaky a man couldn't walk on it soon got firm enough for a dragline to crawl without pads," said B. L. Hale, General Superintendent. "Subsurface water ran to the well-points from distances as far as 1,000 feet away, and the sand soon dried up so well you wouldn't know it was the same material," he added.

The only trouble developed very early in the dewatering work. The pumps, set down on the level of the river floor, were vulnerable to the constant hard winds and driving sands which whip at high velocity across the river. Dry sand blew into the intake manifolds of the engines on the pumps, and in a month's time three engines failed, their insides torn to pieces by sand. As fast as they failed, International UD-9 diesel industrial power units were brought in and hooked to the pumps. The sealed-in construction of the UD-9 successfully blocked off the sand, and there was no more trouble.

Hale said, "Frankly, I was a little dubious myself about whether well-points would work in the Canadian River, but they certainly convinced me they were the answer to my problem."

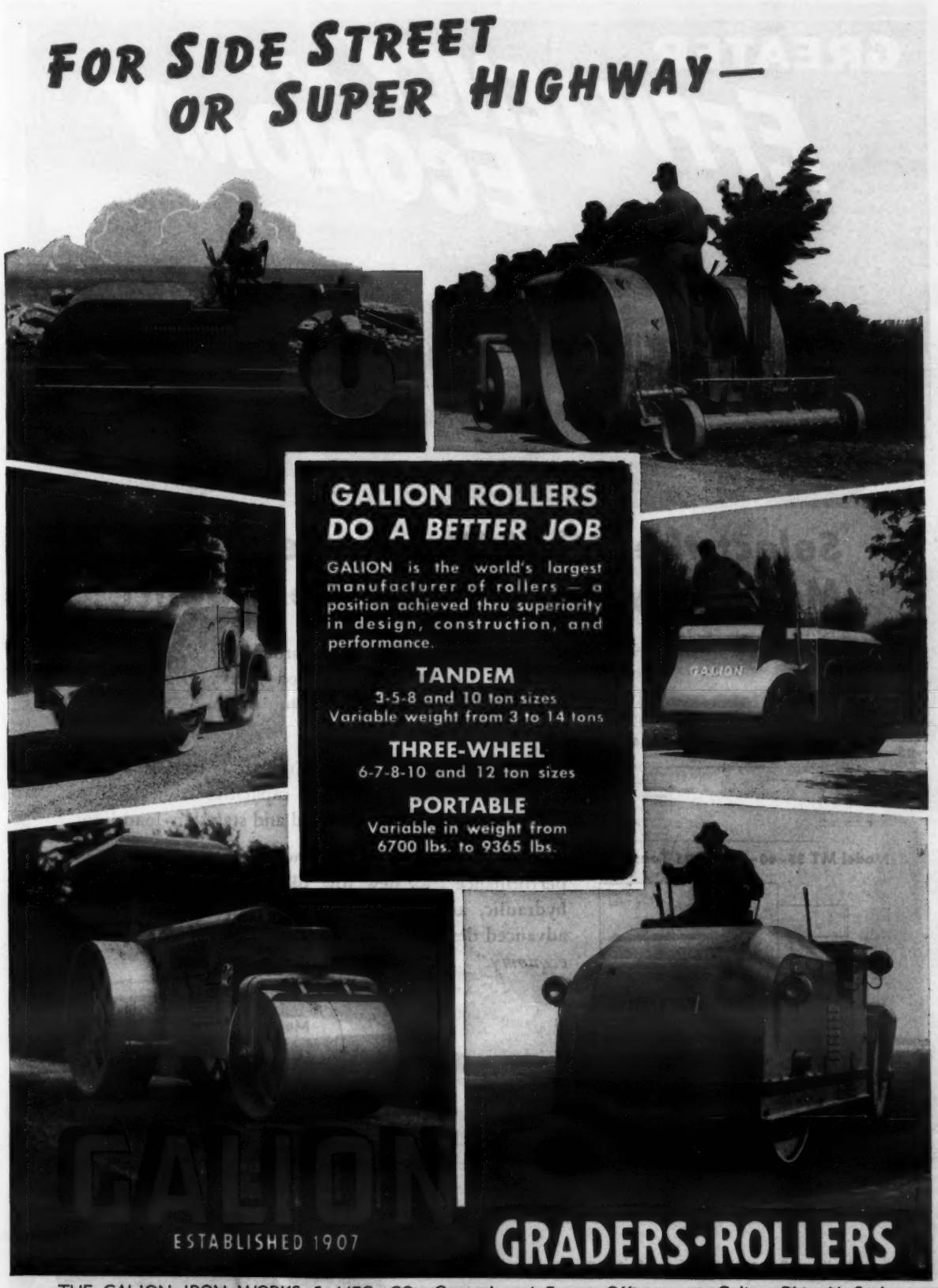
Stabilized Road Built

As dewatering proceeded, a portland-cement-stabilized road 16 feet wide was built adjacent to the bridge on the downstream side, so that after the well-points were jetted out, the "highway" would support cranes and truckloads of structural steel.

Approximately 80 sacks of portland cement were used per 100-foot station. This material was mixed into the sand thoroughly by a Seaman Pulvi-Mixer, compacted with a small roller, and bladed smooth. Although this work was done at the contractor's expense, it saved a lot of money when the piers were ready for structural steel.

(*Continued on next page*)

HOOKS, TONGS
GRIPS and
SLINGS
No. 464
366
No. 245
No. 421
A COMPLETE LINE OF HOIST GRABS—for fast safe handling of *pipe, rails, drums, plate* and *structural steel, stone, timber, boxes* and *odd-shaped objects*. Carefully engineered Downs Hoist Grabs have a safety factor much greater than capacity ratings listed. Many types of hooks, tongs, grips and slings available for quick delivery.
WRITE FOR FREE ILLUSTRATED CATALOG #200
DOWNS CRANE & HOIST CO.
MECHANICAL ENGINEERS
340 W. VERNON AVENUE
LOS ANGELES 37, CALIF.
Electric Cranes • Hand Cranes • Jib Cranes • Sheaves • Sheave Blocks
Plate Grips • Plate Hooks • Crane Trolley Hoists • Crane Wheels • Crane End Truck Units • Jib Crane Fittings • Automatic Mechanical Load Brake Crane Hoist Blocks


FOR SIDE STREET
OR SUPER HIGHWAY—
GALION ROLLERS
DO A BETTER JOB
GALION is the world's largest manufacturer of rollers — a position achieved thru superiority in design, construction, and performance.
TANDEM
3-5-8 and 10 ton sizes
Variable weight from 3 to 14 tons
THREE-WHEEL
6-7-8-10 and 12 ton sizes
PORTABLE
Variable in weight from 6700 lbs. to 9365 lbs.
GALION
ESTABLISHED 1907
GRADERS·ROLLERS

THE GALION IRON WORKS & MFG. CO., General and Export Offices — Galion, Ohio, U. S. A.
Cable address: GALIONIRON, Galion, Ohio

Wellpoints Dewater River Bridge Piers

(*Continued from preceding page*)

Pier Excavation Precedes Piles

The same Thew-Lorain 41 dragline which built the dikes was used for the structural excavation of the bridge piers. Excavation for each pier consisted of a block of sand 50 x 72 feet on the surface and 10 x 50 feet 18 feet down. Using a 1-yard dragline bucket on a 50-foot boom, the Thew-Lorain machine moved in after dewatering and dug one of these holes in an average of 8 hours, despite the fact that it was somewhat overloaded.

Once the structural excavation started on a pier, the remaining operations followed in rapid-fire sequence. The next operation was pile driving. Plans called for at least 8 piles under each pier, with 6 under every fourth pier. These piles were to be 14-inch 73-pound steel H-beams. The plans called for a bearing capacity of 56 tons per pile at finger joints, 47 tons at center of unit, and 53 tons at quarter points.

A Thew-Lorain 75-B crane with a 65-foot boom and a set of swinging leads drove the piles, using a Vulcan No. 1 steam hammer and a 55-hp oilfield type of horizontal boiler. In order to develop the proper bearing, test piles indicated that relatively long H-beams would have to be used. This checked out in the field very accurately, and the average length of pile was 60 feet. Average pile-driving production was about 8 pieces per shift.

Bearing capacity, however, was somewhat lower than the test piles had indicated, so it was necessary to drive two extra piles under several piers. Final figures on the job showed a total quantity of 13,997 feet of H-beams and 593 linear feet of test piles.

Pier Form Work Prefabbed

Within 2 hours from the time the pile driving was finished on a pier, concrete work was under way. This rapid sequence of construction was achieved by prefabricating forms for the pier footing and shaft pours away from the work area, and then setting the complete assembly in place with a crane. Irvington steel tank forms were used for this first pour, and the steel reinforcement was also prefabricated and craned in place as soon as the forms were set.

From the construction joint near ground level to the top of piers, steel forms made up at the Mosher Steel Co. plant in Dallas were used. This second assembly of a form completed a pier when filled with concrete. Prefabricating the pier form work shortened the time a pier was vulnerable to flood damage all through the job.

Deck form work was, of course, supported on the I-beam girders, and was made out of 1 x 10-inch shiplap lumber. Curb and walkway forms were 2 x 10 smooth lumber, made up in panels for easy assembly.

Concrete Work

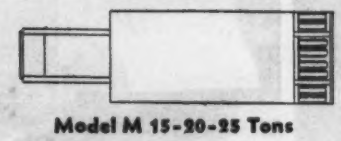
The job called for the placement of 1,541 cubic yards of Class A concrete in the piers and 1,782 cubic yards of Class A material in the deck slab. All of this concrete was batched out of a commercial plant in Borger and supplied to the job by Plains Materials & Concrete Co. It was sent to the job and mixed en route by a fleet of Rex truck-mixers.

At the job, the truck-mixers backed in to a Lorain crane and discharged the fresh concrete to a 1-yard Blaw-Knox concrete bucket, which was then hoist-

(*Concluded on next page*)

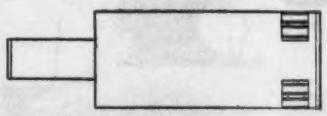
GREATER EFFICIENCY AND ECONOMY THE DORSEY

Select the DORSEY Low Bed Machinery Trailer with Confidence!



Model M 15-20-25 Tons

Model MT 35-40-50-60-75 Tons



Model MK 10-15 Tons

Contractors and Engineers throughout the nation are selecting the Dorsey Low Bed Heavy Duty Semi or Full Trailers to move heavy equipment . . . to "Make the Heavy Jobs Light."

Dorsey Low Beds are available in four models — M — MK — MTS and MT — with capacities from 10 T to 75 T — a model for every need and state law load limit.

"Engineered for minimum weight . . . safe road performance . . . new low platform height . . . new hydraulic, air or vacuum brakes, all are features of advanced design that insure *low, dependable, operating economy.*"

DORSEY TILT-TO-LOAD TRAILERS

Model MTS

15-20-25-30-35 Tons

A-7 7,500 lb. A-15 15,000 lb. A-20 20,000 lb.

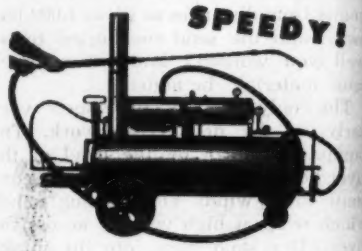
DORSEY TRAILERS

ELBA ALABAMA, U. S. A.

Increase profits CLEAN with Steam

Siebring Portable STEAM CLEANER

SIMPLE! SAFE! SPEEDY!



The time-saving, cost-cutting Siebring Steam Cleaner speeds repair work . . . saves costly man hours. Continuous flow of steam for hours assures fast, thorough cleaning on the toughest grease and dirt-packed jobs by providing steam or hot water or *both* UNDER PRESSURE, with powerful, cutting chemicals. First, it knocks loose, then it dissolves and removes the firmest holding, most stubborn dirt, grease, and grime.

LOW COST! PORTABLE!

Completely portable . . . can be operated independently of city water pressure or electricity.

TRY IT AT OUR RISK!

Send handy coupon today for illustrative literature and facts about Siebring's 10 Day "FREE TRIAL" Offer. See for yourself how the Siebring Steam Cleaner will save costly man hours and speed your toughest cleaning jobs.

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SIEBRING MFG. CO., Dept. CE-1, George, Iowa

RUSH illustrative literature and 10 Day "FREE TRIAL" Offer.

Name .....

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COMPLETE WELL POINT SYSTEMS

WILL DRY UP ANY EXCAVATION

Faster—More Economically

Write for Job Estimate and Literature

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36-40 11th St., Long Island City, N.Y. Tel. IRonsides 6-8600

ed to the pour by the crane. A Viber electric vibrator consolidated the concrete. Deck pours were finished off with a pulled-belt finish, and a 6-inch-wide traffic-dividing marker strip of black oxide was also installed as each panel was poured.

The very important mats of reinforcing steel in the deck slabs were supported the proper distance from the outside of the slab by means of 2 x 4 blocks, notched so they would support the steel until after the pour. After the concrete was placed, these supporting blocks were removed, leaving the steel reinforcement embedded accurately in the wet concrete.

Cotton mats, kept continuously wet for 8 days, were used as the curing media on the bridge concrete.

Steel-Erection Work

Plans required some 2,042,242 pounds of structural-steel members, all of which was furnished by Bethlehem Steel Co. The main members were the 81-foot 3-inch I-beams 36 inches deep. Each of these pieces weighed approximately 14,000 pounds.

The structural steel arrived at Borger over the Santa Fe railroad, and was unloaded at a spur siding by a Thew-Lorain 41 crane. An F-6 Ford truck hauled the steel out to the job, carrying two 7-ton pieces per trip.

Erection of structural steel was just as efficiently organized as the other earlier parts of the work, and it proceeded with the same speed. For example, the contractor set up and bolted 325-foot sections in only one day, using the 75-B Thew-Lorain and a 5-man rigger crew. Riveters and welders followed very close behind. The riveting gang drove 1,186 good rivets in a 9-hour shift one day, doing their own bolting up and removing.

Little "high climbing" was involved here, because the bridge deck is only 17 feet in the clear of the wide, shallow riverbed. If the Canadian River ever filled up to a point 4 feet below the girders, it would be a major flood.

Approaches Built

Earth approaches at each end of the structure consisted of perhaps 25,000 cubic yards of excavation and grading, with another 16,500 cubic yards for channel excavation. The approaches were built up by three Caterpillar DW10's, a D8 push cat, a D8-mounted Caterpillar bulldozer, and a Caterpillar No. 12 motor grader. The dirt, a reddish clay, was laid down in 6-inch lifts, then watered and rolled.

The approaches to the new bridge have been designed to tie in to a new grading contract through the rough country on each side of the stream, and when completed, there will be tangent approaches 2,200 feet long on the south side and 4,700 feet long on the north side of the new structure.

A shortage of unskilled and semi-skilled labor through the entire job dogged the contractor's efforts, resulting in considerable skilled men on the job. Bad weather in January and February forced the work to stop. But the excellent organization and methods which began on October 25, 1947, when the dirt work started, already had the job well in the clear, and it was expected that traffic would be using the bridge by August 1, 1949. Work on the bridge proper was started May 1, 1948.

Personnel

The Canadian River Bridge was designed under the direction of D. C. Greer, State Highway Engineer, and J. P. Exum, Bridge Engineer. James G. Lott was District Engineer at Amarillo, and W. E. Neill was Senior Resident Engineer on the job.

For John F. Buckner & Sons, B. L. Hale was General Superintendent, assisted by F. W. Oakes. Grady Clarkson was in charge of pile driving, and W. D. Ferguson was Concrete Foreman.

Steel Tackle Blocks

A line of tackle blocks and other accessory equipment for the handling of both manila and wire rope is available from the Moline Iron Works, 130 Second St., Moline, Ill. The steel tackle blocks, either iron or bronze-bushed, with loose side or swivel hooks, will handle manila-rope sizes of ½, ¾, and 1 inch in the single, double, or triple-sheave type. The heavy steel tackle blocks for wire rope are available, with shackles or hooks, for rope sizes of ⅜, ½, ⅝ and ¾ inch in the single, double, or triple-sheave type.

A variety of accessory equipment may be obtained: heavy-duty steel snatch blocks, load binders, wire-rope clips, washers, steel roller-bearing rope hoists, wire stretchers, and pump-rod couplings.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 26.

Hydraulic Shop Presses

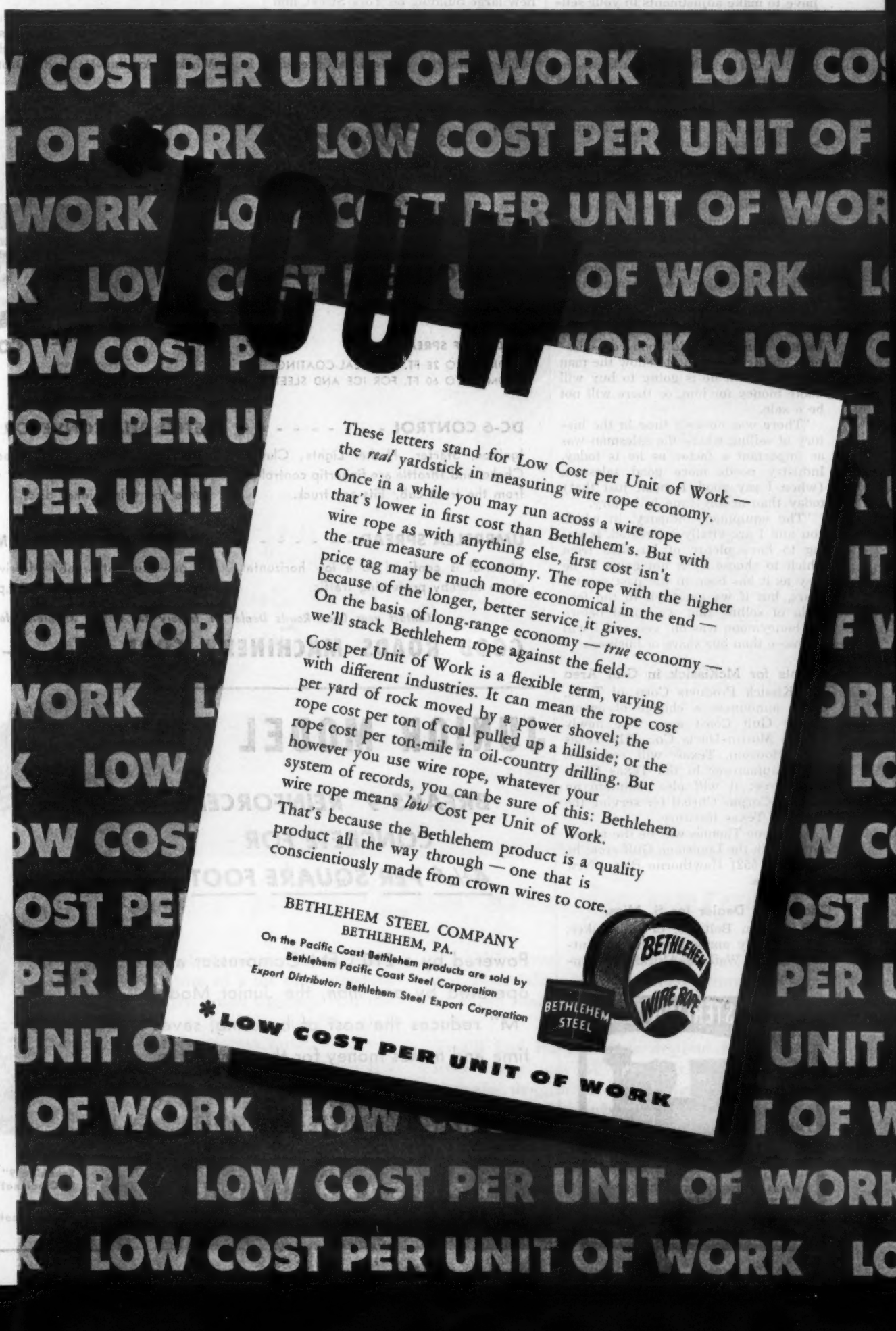
Hydraulic shop presses in capacities of from 60 to 400 tons are described in a 16-page catalog distributed by Rodgers Hydraulic, Inc., 7415 Walker St., St. Louis Park, Minneapolis 16, Minn. Catalog 313 discusses the construction and operation of these units and lists their complete specifications. It also includes descriptions of Rodgers hand and power pumps and press accessories.

The tables of specifications cover the type of pump unit used with each model of Rodgers press, the ram speed of the pressure stroke, important dimensions, and approximate weights. Each size of press is illustrated, and the illustration is accompanied by a listing of the principal construction features of each.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 99.

To Handle Dozer Blade Fork

The Parkersburg Rig & Reel Co. of Parkersburg, W. Va., has recently obtained a contract from the Dozer Blade Fork Co. to handle the latter's product on an exclusive basis. The company will stock and sell the dozer blade fork nationally.


LOW COST PER UNIT OF WORK
These letters stand for Low Cost per Unit of Work — the *real* yardstick in measuring wire rope economy.
Once in a while you may run across a wire rope that's lower in first cost than Bethlehem's. But with wire rope as with anything else, first cost isn't the true measure of economy. The rope with the higher price tag may be much more economical in the end — because of the longer, better service it gives.
On the basis of long-range economy — *true* economy — we'll stack Bethlehem rope against the field.
Cost per Unit of Work is a flexible term, varying with different industries. It can mean the rope cost per yard of rock moved by a power shovel; the rope cost per ton of coal pulled up a hillside; or the rope cost per ton-mile in oil-country drilling. But however you use wire rope, whatever your system of records, you can be sure of this: Bethlehem wire rope means *low* Cost per Unit of Work.
That's because the Bethlehem product is a quality product all the way through — one that is conscientiously made from crown wires to core.
BETHLEHEM STEEL COMPANY
BETHLEHEM, PA.
On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation
Export Distributor: Bethlehem Steel Export Corporation
BETHLEHEM WIRE ROPE
BETHLEHEM STEEL
*LOW COST PER UNIT OF WORK

Distributor Doings

Larry Glaser of Littleford Offers Some Advice to Dealer Salesmen

"Don't sell the road-building industry short," advises Larry Glaser, Sales Manager of Littleford Bros., in a recent issue of the "Elbee Tatler". If you're losing deals because of severe competition, pull up another notch in your belt and go out after the next job a lot harder.

"This competition which you are experiencing, even during the busiest period of the season, is not unusual at this time. As this is an adjustment period, you as salesmen are going to have to make adjustments in your selling methods. Do more planning on the calls you are going to make. Read the selling features of the equipment you handle, and be sure that you know the competitive equipment on each line. When you get into a hot deal, go to your manufacturer—tell him your problems, and he will offer some help in offsetting some of this competition. . . .

"Every newspaper and trade paper today talks about the terrific spending program on roads, bridges, docks, dams, etc., and many states have a full budget for road building and the Federal appropriations are available for a period of two to three years, so there is no possibility of a let-down in sales of road-building equipment for some time to come. While good will and reputation built up by manufacturers for many years is still a very valuable asset, we must depend upon you salesmen on the firing line to show the man the equipment he is going to buy will make money for him, or there will not be a sale.

"There was never a time in the history of selling where the salesman was as important a factor as he is today. Industry needs more good salesmen (when I say good, I mean just that) today than at any time in history.

"The equipment industry, in which you and I are vitally interested, is going to have plenty of business from which to choose. It is not going to be easy as it has been in the past several years, but if we get back to the formula of selling that was used before the honeymoon was on, you and I will get more than our share of business."

Agents for McKissick in Gulf Area

McKissick Products Corp. of Tulsa, Okla., announces a change of agents in the Gulf Coast area. The newly formed Martin-Davis Co., 1710 Texas Ave., Houston, Texas, will represent the manufacturer in the Texas Gulf-Coast area; it will also maintain an office at Corpus Christi for serving the southern Texas territory.

H. Eugene Thomas will be the representative in the Louisiana Gulf area; he resides at 5521 Hawthorne Place, New Orleans, La.

Chain Belt Dealer for S. Miss.

The Chain Belt Co. of Milwaukee, Wis., recently announced the appointment of the Watkins-Aldridge Equipment Co., Ltd., S. State St., Jackson, Miss., as distributor of the complete line of Rex construction machinery in the state of Mississippi, south of and including the counties of Bolivar, Sunflower, Tallahatchie, Grenada, Webster, Clay, and Lowndes.

Canadian Dealer's Four-Year Growth

The Industrial Division of J. Clark & Son, Ltd., of Fredericton, New Brunswick, Canada, started out four years ago as a small office run by one man, Frank Terris. Now it is a strong, well known equipment distributor with a new large building on York Street, and Mr. Terris is now a Director of the parent company, which has eight other branch offices in New Brunswick.

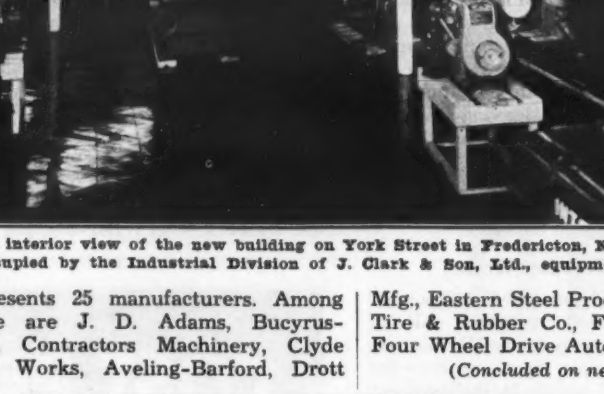
The Industrial Division at present represents 25 manufacturers. Among these are J. D. Adams, Bucyrus-Erie, Contractors Machinery, Clyde Iron Works, Aveling-Barford, Drott Mfg., Eastern Steel Products, Firestone Tire & Rubber Co., Flink Sales Co., Four Wheel Drive Auto Co., Gorman-

(*Concluded on next page*)

An interior view of the new building on York Street in Fredericton, New Brunswick, occupied by the Industrial Division of J. Clark & Son, Ltd., equipment distributor.

it's "The Jet" with DC-6 CONTROL
DIRECT CAB

CAPACITY 7 CUBIC YDS.



FOR SEAL-COATING . . . ICE AND SLEET CONTROL

WIDTH OF SPREAD:
FROM 12 TO 28 FT. FOR SEAL-COATING.
FROM 12 TO 60 FT. FOR ICE AND SLEET CONTROL.

DC-6 CONTROL - - - - - - - - - -
Ignition, Starter, Flasher Lights, Clutch, Choke, and Throttle are fingertip controlled from the truck cab. Fits any truck.

STEEL BELT CONVEYOR - - - - -
The controlled intermittent action shakes materials down through the wide throat onto the twin spinner discs.

UMBRELLA SPREAD - - - - - - -
Material is confined to a low horizontal plane thereby protecting traffic.

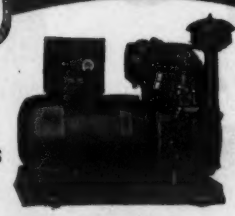
WATERPROOF, AIR-COOLED MOTOR - -
A powerful unit capable of driving the twin spinners at a speed of 2400 r.p.m.'s.

SPREADS ANY MATERIAL:
SAND
GRAVEL
LIME
SALT
CINDERS
CALCIUM-CHLORIDE
ANY OTHER DESIRED

Contact your Good Roads Dealer or factory for further detailed information or a demonstration

GOOD ROADS MACHINERY CORP. - - - - - - - - - - MINERVA, OHIO

STERLING LIGHT PLANTS



THE CHOICE OF LEADING CONTRACTORS
SIMPLE—DEPENDABLE—RUGGED
WRITE FOR LITERATURE
STERLING MACHINERY CORPORATION
405 Southwest Blvd. Kansas City

JUNIOR MODEL "M"

BREAKS 9" REINFORCED CONCRETE FOR 4½¢ PER SQUARE FOOT

Powered by a 210 CFM Compressor and operated by *one man*, the Junior Model "M" reduces the cost of breaking, saves time and makes money for the contractor.

WRITE FOR COMPLETE INFORMATION

R.P.B. CORPORATION
2751 East 11th Street · Los Angeles 23, California

Breaking 9" Reinforced Concrete* on a recent job in Cincinnati

*Cuts 5-foot width in one standing

Distributor Doings

(Continued from preceding page)

Rupp, W. F. Hebard, Frank G. Hough, Hughes-Keenan, Isaacson Iron Works, McCulloch Motors, New Holland Mfg., Northern Machine Works, Pacific Car & Foundry, Ready Power Co., Wettlaufer-Welker, Wisconsin Motors, and Worthington Pump & Machinery Corp.

In the general offices of the Industrial Division are Office Manager Joe Scott, Mrs. Faith LaPointe, and Miss Joan Mayne. Doug Pickard is a new field representative; Ivan Forbes is Parts Manager; and Bill Stewart is Service Manager. Working with Stewart are Everett Hopey, Helaire Jackart, and Albert Haines.

Adds U.S.I. Anti-Freeze Product

The Pennsylvania Refining Co., Cleveland 4, Ohio, has been appointed authorized distributor for U.S.I. permanent anti-freeze, newest product of U. S. Industrial Chemicals, Inc. The decision to distribute a permanent anti-freeze was taken by the company as part of its expansion program.

New Holland Adds a Distributor

Miller, Bradford & Risberg, Inc., 203 N. Dewey St., Eau Claire, Wis., has been appointed distributor for the New Holland Mfg. Co., Mountville, Pa. The firm will distribute New Holland quarry and pit equipment in eastern Wisconsin and the northern peninsula of Michigan.

Concrete Drill Distributorships

The Concrete Termite Drill Co., 2082 Foothill Blvd., Pasadena 8, Calif., announces that it has some distributorships open. The company invites requests for particulars from those interested.

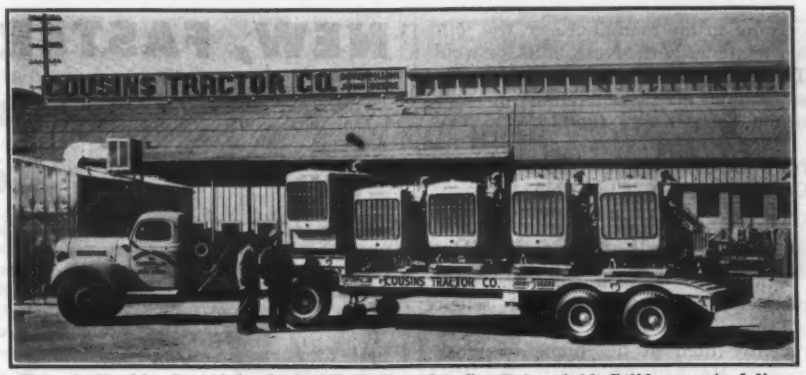
Larkin Opens Branch in Rockford

Pending the completion of a new modern branch house, the R. C. Larkin Co. of Chicago, Ill., is now serving the Rockford, Ill., territory from temporary quarters on Samuelson Road on the outskirts of Rockford. Adaptation and renovation work on the temporary quarters is now completed, and the installation of show-room machinery, parts, and shop and service facilities is in progress.

The new permanent Larkin facilities will be located on a recently purchased 10-acre site on U. S. Highway 51. Gilbert Johnson, Rockford architect, has been commissioned to design the modern 80 x 140-foot structure which will include offices, a display room, a complete parts department, repair service shops, a machinery warehouse, and an accompanying storage yard.

The R. C. Larkin Co. was established in 1930, and has its headquarters in recently enlarged offices at 3001 S. Wabash Ave., Chicago. Its President, R. C. ("Rex") Larkin, has been in the business all his life, as has Herbert B. Cadmus, Vice President and General Sales Manager. Don Peak, Service Manager, and Art Dubois, who heads the parts and service departments, have each been with the company for a period of 15 years.

Among the companies represented by Larkin are the International Harvester Co., Frank G. Hough Co., and Thew Shovel Co.



Francis Muchin, Superintendent of B. V. Farming Co., Bakersfield, Calif., accepts delivery of five new Caterpillar diesel D8800 engines from D. D. Davies, Manager, the Cousins Tractor Co., Bakersfield, Calif. The D8800's will power new wells to irrigate 6000 acres for cotton-growing.

Semi-Trailer Used With Dump Trucks

A new low-platform semi-trailer for use with dump trucks, primarily designed for transporting construction equipment, has been announced by Mead Machine & Iron Works, Inc., 606 Lexington Ave., Warren, Pa. It can be used to carry shovels, bulldozers, and the like in capacities from 10 to 25 tons.

The goose neck of this trailer is designed to go above the truck tail-gate, and reaches a point several inches ahead of the truck axle, thus placing the load in proper place on the truck. The fifth wheel is integral with the neck, allowing the trailer to be connected to the truck in two minutes by one man. It does not require bolting, clamping, or any other fastening. Due to this design, use of the dump body for its original purpose is not interfered with in any way.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 22.

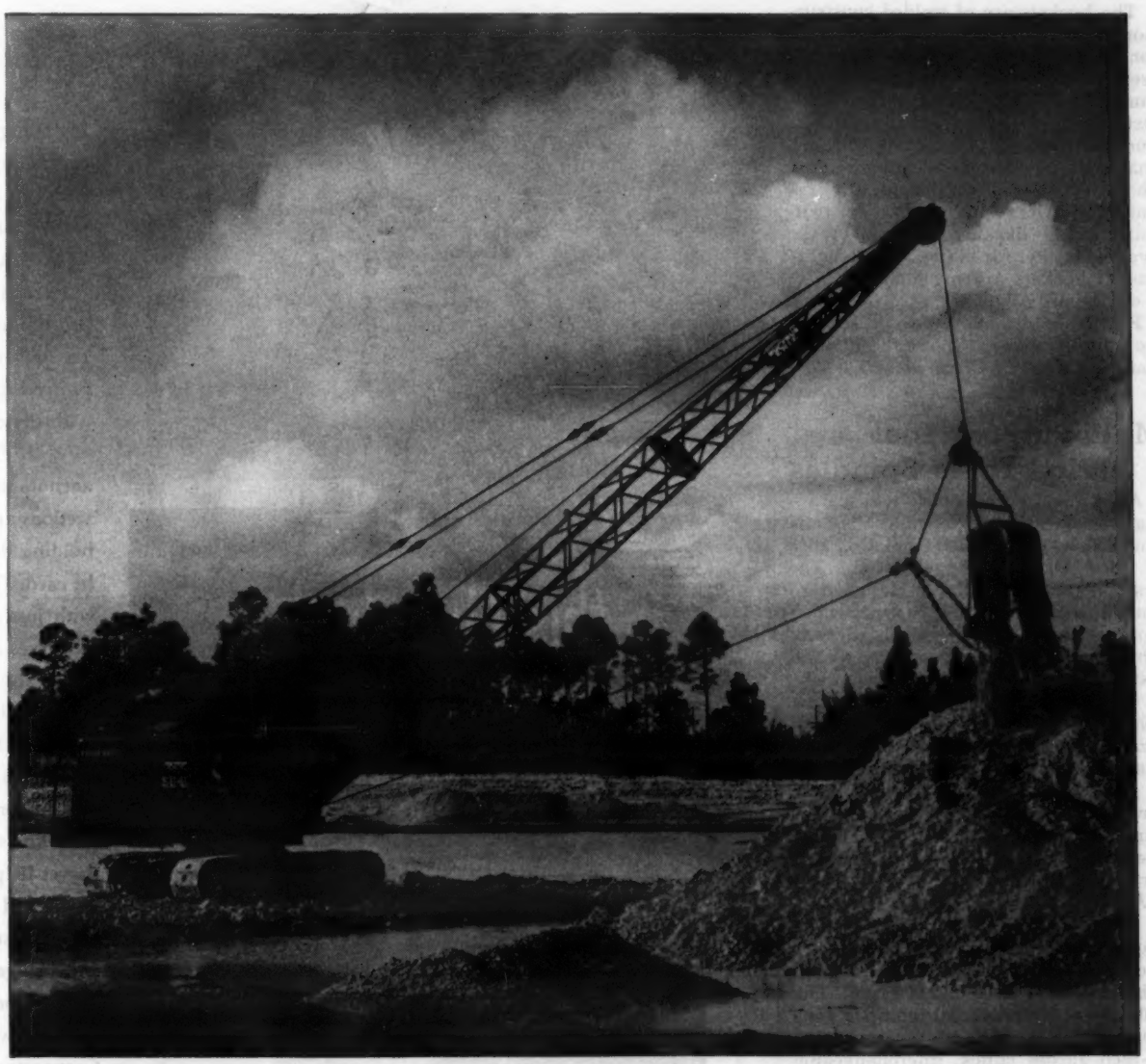
For the Finest in Chain Saw Performance — Lombard Model 7 Two Man Saws with new Warren High Speed Chain

Dealer opportunities in some areas.

- Cuts easier because of governed chain
- Cuts faster result of unique plow-shaped teeth
- Cuts longer without dulling Teeth made of tool steel
- Local demonstration arranged!

Also One Man Saw—Available Soon

LOMBARD GOVERNOR CORP.
ASHLAND, MASSACHUSETTS



Put your money on steady output

On the job, as regularly as the timekeeper. On the job — in spite of a lot of yesterdays crammed with really tough digging. On the job — even after a big yardage-life that would count most excavators out.

On the job — that's your Bucyrus-Erie. It's a machine you can depend on for big output, especially when you need it most. It's a machine that works longer because it works easier.

You'll find Bucyrus-Erie dependability built into every one of the quickly-convertible shovels, draglines, dragshovels, and cranes in this ⅜ to 2½-cubic-yard line. It's one of the reasons why the foremost users of excavators consistently "buy Bucyrus".

BUCYRUS ERIE

The BEST buy Bucyrus, the best BUY in excavators

Bucyrus-Erie Company
South Milwaukee, Wisconsin

141E49C

Pettibone Mulliken's new dragline buckets in ⅜ to 2-cubic-yard capacities are said to represent a 20 to 40 per cent reduction in weight over other buckets of those capacities.

Light Weight Marks New Dragline Buckets

A series of lightweight perforated dragline buckets has been added to the line of materials-handling buckets and dippers manufactured by the Pettibone Mulliken Corp., 4700 W. Division St., Chicago 51, Ill. The company claims that, for their capacities, these buckets represent a 20 to 40 per cent reduction in weight.

The buckets are of welded construction with 14 per cent manganese steel for the lip and socket-point type of teeth, sheave, wire-rope sockets, and dump-chain links. Design and construction features are said to give these buckets a wide set of corner teeth and sharp cutting edge, so that they require about two-thirds of the usually required drawbar pull, and only two-thirds of the distance required by the average bucket for filling. These lightweight buckets are available in ⅜ to 2-cubic-yard capacities.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 43.

Multi-Purpose Tool Has Three Spindles

A multi-purpose electric tool featuring three separate spindles is announced by the Smilan Tool Co., 2848 W. Pico Blvd., Los Angeles, Calif. The first of these spindles is designed to handle drills of ¼-inch capacity when working in metal, or ½-inch capacity when working in hardwood. The second spindle provides a reciprocating stroke of ⅜ inch and is recommended by the company for hack sawing, reciprocating sanders, hammers, and similar tools. The third spindle, set at right angles to the tool, is for right-angle drilling, for sanding or buffing with disks, or for wire-brush applications; it can also be used with a flexible shaft or adapted for circular saws.

A Hi-Lo shift increases the gear ratio of the tool from 5 to 1 to 10 to 1, to provide ample torque for heavy-duty use and operation at either of two spindle speeds: 1,000 or 2,000 rpm. The 110-volt ac/dc universal motor is controlled by a built-in trigger switch. A ¼-inch Jacobs chuck, interchangeable on all three spindles, is provided with the tool. An auxiliary, demountable handle can be used at the end or bottom position for two-hand operation. Special accessories are available for use with the tools.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 76.

All-Aluminum Ladders

All-aluminum ladders in several styles are manufactured by Zero-Lite Products, 317 Sherman St., Chicago, Ill. A 6-foot ladder of this type is said to weigh under 7 pounds; a 40-foot extension ladder, only 50 pounds. The ladder side rails are made from extruded and drawn wall tubing and measure 2½ inches x 0.75 x 0.065 inch.

The base of the ladder has a heavy-duty solidly inset rubber foot which is slotted for safety shoes. The rungs are ribbed for safe and sure footing. According to the manufacturer, the joints are made without rivets, bolts, or welds. Two sets of slide guides on the extension ladder are designed to assure maximum strength and rigidity.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 101.

Hogentogler Dies at 62

Chester A. Hogentogler, 62, retired pioneer investigator in soil science of the Public Roads Administration, recently died at his home in Washington. He had been with the PRA for nearly 30 years, and he headed its research in soil science from 1926 until shortly before his retirement in 1948. Mr. Hogentogler, long active in the American Road Builders' Association, received the Bartlett Award of the ARBA, American Association of State Highway Officials, and Highway Research Board, and the Dudley Award of the American Society for Testing Materials.

NEW, FASTER Way to Drive or Remove Nuts, Bolts, Cap Screws

Van Dorn IMPACT WRENCH

This great, new Van Dorn Impact Wrench is sure to save you time and money on assembling and disassembling jobs! Powerful and sturdy—delivers 2000 rotary impact blows a minute. No uncomfortable jarring or twisting—no "fighting" the Wrench to get results. Easy to remove fasteners, even the stubborn "frozen" ones. Motor cannot be stalled—even if spindle is stopped "dead"—so there's no danger of overload or "burn-out." Weighs only 8¼ lbs. Full ⅜" capacity. Ask your nearby Van Dorn Distributor for details. Write for free catalog to: The Van Dorn Electric Tool Co., 787 Joppa Road, Towson 4, Maryland.

For Power Specify "Van Dorn" (DIV. OF BLACK & DECKER MFG. CO.) PORTABLE ELECTRIC TOOLS

Installing guardrail can be difficult and time consuming when you are "gathering up the loose ends" of a big highway construction job. Or you can do it the easy way by using FLEX-BEAM Guardrail.

Here is a modern safety aid that is tops in protection and also is easy to install. Whether you are finishing up a main highway or merely protecting a dead-end street, you'll be pleased with the ease and speed your men can do the job.

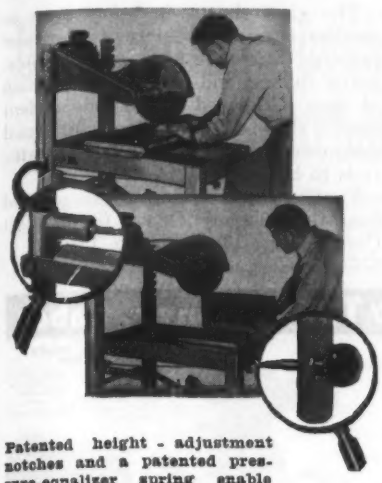
With FLEX-BEAM Guardrail there are no end anchorages, turnbuckles, or castings. Individual sections are spliced with seven bolts, the center bolt holding the rail to the post. Any type post may be used. The work is done quickly and economically with just a small, unskilled crew.

Curves are no problem either with FLEX-BEAM. Stretching is not required and posts stay in perfect alignment. Sections can be shop curved to fit any desired radius from 20 to 150 feet. Greater radius curves do not require shop forming.

Another thing you'll like about FLEX-BEAM is its fine appearance. Smooth lines and graceful curves help "dress-up" any job. Write us for prices and other information. Ask too, about easy-to-install FLEX-BEAM Bridge Rail, for bridges and bridge approaches. Armco Drainage & Metal Products, Inc., 3369 Curtis Street, Middletown, Ohio. Subsidiary of Armco Steel Corporation. Export: The Armco International Corporation.

FLEX-BEAM Guardrail

ARMCO



Patented height - adjustment notches and a patented pressure-equalizer spring enable the Clipper saw to handle materials of varying sizes.

Masonry-Saw Line

Nine models of masonry saws are now being turned out by the Clipper Mfg. Co., 2800 Warwick, Kansas City 8, Mo. These saws are designed to cut all types of masonry material: concrete, cinder, vitreous marble, and glazed tile. Each has particular features to handle a specific range of materials.

The Model C, with a 12-inch blade capacity, is used for small masonry products. For materials of a larger size the Models E, H, and HD with a 14-inch blade capacity may be used. The Model J Clipper saw, with an 18-inch blade capacity, is adaptable for very heavy duty as in engineering and highway work where test cuts on concrete cores are to be made.

Every Clipper saw is portable, since it is composed of three separate parts—the self-aligning conveyor cart, the cutting-head assembly, and the saw frame. The saws are powered by 1½-hp motors. Clipper Superior (abrasive) or Clipper bonded diamond blades may be used on all models.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 63.

Fittings for Pipe Lines

A new catalog, Bulletin 492, has just been released by the Taylor Forge & Pipe Works, P. O. Box 485, Chicago 90, Ill. This 22-page folder describes the company's new main-line fittings for gas transmission lines. It features the Taylor Forge Compound Tanj-ells which are used for contour bends of all sizes and angles. The features, methods of use, and tables for determining the types and sizes required are included in the booklet.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 143.

Cable-Cutter Folder

A catalog on the Hydrashear portable cable-cutters is available from the Pell Cable Cutter Co., 55 New Montgomery St., San Francisco 5, Calif. This bulletin lists the features, methods of use, and specifications for the Models JG and LC cable cutters.

The JG is 14 x 5 x 7 inches, weighs approximately 40 pounds, and will cut wire rope up to and including a 1⅛-inch size. The LC is 16 x 6 x 8½ inches, weighs approximately 70 pounds, and has a capacity up to and including 1½-inch wire rope. Special blades are available for production work when many cuts of the same size of rope are to be made.

This literature may be secured from the company, or by using the Request Card at page 16. Circle No. 62.

Athey Representatives

In accordance with its expanding sales program, Athey Products Corp., Chicago, Ill., has named two new representatives. Reid Evans is now the District Representative for the north-central area. Serving the upper mid-western states, Mr. Evans will have his headquarters in Urbana, Ill. The second appointment is that of Marvin B. Stanley as Sales and Service Representative for the southwest territory. Mr. Stanley will serve the states of California, Nevada, and Arizona, with headquarters in San Leandro, Calif.

Thew 50th Anniversary

On July 17, the Thew Shovel Co. of Lorain, Ohio, celebrated its 50th anniversary as a corporation. Actually, the company's history began 4 years earlier than 1899, when Richard P. Thew, captain of an ore-carrying lake boat, designed and built the first full-revolving shovel. After 4 years of operation as a personal business, The Thew Automatic Shovel Co., was incorporated in 1899, and later re-incorporated as The Thew Shovel Co. Today Thew operates five plants and employs over 1,500 men and women.

EASIER LOADING – GREATER SAFETY WITH
A "TRANSPORT TRAILER"
Jack-over-Axle Line
Capacities Through 25 Ton—Platform and Skeleton Trailers

JACK-OVER-AXLE MODEL WITH SINGLE REAR AXLE

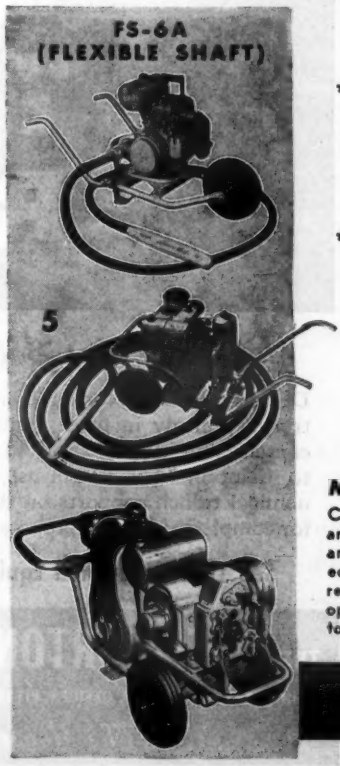
PATENTED JACK-OVER-AXLE FEATURE—WHEREVER WHEELS HAVE TRACTION JACK-OVER-AXLE DROPS THE FRAME—LIFTS THE LOAD.

MODELS AVAILABLE WITH SINGLE REAR AXLE, OSCILLATING REAR AXLES, OR TANDEM REAR AXLES.

TRANSPORT TRAILERS, INC.
TRANSPORTATION ENGINEERING A SPECIALTY
CEDAR RAPIDS, IOWA, U.S.A.

For FASTER PROGRESS
BETTER WORK
and LARGER PROFITS . .
—JACKSON—

1. PAVING UNIT:
(consisting of electrically vibrated, manually guided paving machine and portable power plant) a great producer, ideal for MUNICIPAL PAVING, BRIDGE DECKS and HIGHWAY WIDENING. Strikes off to all crowns, undercuts at curb or sideform, works right up to and around manholes and other obstructions. Inexpensive.



*** 2. SOIL COMPACTOR:**
Can be used to tremendous advantage in compacting granular backfill in BRIDGE APPROACHES, close to BRIDGE ABUTMENTS, under FACTORY FLOORS, along side FOUNDATIONS, under FOOTINGS, RAMPS, MUNICIPAL PAVEMENTS, SIDEWALKS and many other places. One man can easily guide two side by side. Delivers up to 4500 ½-ton blows per minute.

*** 3. SIDE FORM VIBRATOR:**
Works equally well mounted ahead of finisher screed or in rear of spreader. Controlled by finisher operator. Saves better part of two men's labor. Will not penetrate through concrete to subgrade.

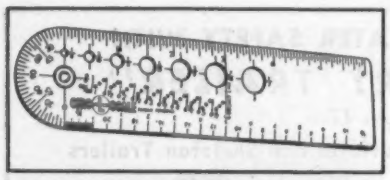
4. MASS CONCRETE VIBRATOR:
This machine has a tremendously impressive record on nearly all of the nation's large dam projects.

5. HYDRAULIC VIBRATOR WITH 50 FT. REACH:
Highly dependable and efficient. Reaches hard-to-get-at places with minimum moves of power unit.

M-2 POWER PLANT
Capacity 2.5 KVA. Other models of 1.25 KVA and 5 KVA. All generate both single-phase and 3-phase 110 volt, 60 cycle AC and are equipped with permanent magnet generators requiring no adjustment or maintenance. For operating all types of vibrators, contractors' tools and lights.

AND MANY OTHER VIBRATORS:
Gas-engine driven, electric, flexible shaft types for general and mass construction, form vibrating, etc. FOR SALE OR RENT at Jackson distributors. Items marked * are manufactured for Jackson Vibrators Inc. See them at distributors of their line.
Descriptive literature on request.

ELECTRIC TAMPER & EQUIPMENT CO.
LUDINGTON, MICHIGAN



The Circ-L-Scale drawing aid combines the functions of protractor, compass, square, scale, and lettering device.

Plastic Drawing Aid

A new drafting aid is announced by L. A. Cuson, 9100 Roselawn Ave., Detroit 4, Mich. This plastic device is designed for use as a compass, scale, square, protractor, or lettering guide. The graduations and locating lines are hydraulically pressed with dies accurate to 0.0002 inch, the manufacturer reports. The Circ-L-Scale is made from a crystal-clear plastic known as Anderolyte which has the wearing qualities and rigidity of steel, says Cuson, and will not warp, burn, or distort.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 2.

Literature on Diesels

A new 24-page issue of "The Dependable Diesel", a magazine for power users, has recently been released by Cummins Engine Co., Inc., Columbus, Ind. It describes the 30-year development of the company's line of diesels and includes an account of the Model NVHS-1200, a 12-cylinder V-type engine developing 550 hp at 2,100 rpm.

The booklet contains stories about Commander D. B. MacMillan's use of the Cummins marine diesels in arctic exploration, and about the use of Cummins diesels by Colonial Sand & Stone Co., Inc., on short-haul operations. It also illustrates the role of diesels in construction, and other industries.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 123.

One-Gallon Stroke Pump

A bulletin on a one-gallon stroke pump, Model H-100, for handling gasoline, fuel oil, etc., is available from the Hatco Corp., 947 W. Goodale Blvd., Columbus 8, Ohio. The sheet describes the pump as complete with a foot valve attached to the end of a 32-inch suction pipe, an overhead discharge, a 7-foot hose, and a ¾-inch nozzle. A detailed sectional drawing shows all component parts of the pump.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 136.

Marion Personnel Changes

Appointment of Milton S. Pohler as District Manager in charge of the Birmingham, Ala., office has been announced by Marion Power Shovel Co., Marion, Ohio. Mr. Pohler succeeds the late R. P. Thompson. Previous to this appointment he had served as District Manager of the company's Kansas City office. Mr. Pohler's headquarters are at 901 American Life Bldg. in Birmingham.

Marion also announces the appointment of W. D. Calland as Sales Representative for eastern Missouri and the southwest section of Illinois. He will maintain headquarters at 411 N. 7th St., Suite 713, St. Louis, Mo.

Dan G. Stevens has been appointed Sales Representative with headquarters in the home office in Marion, Ohio.

Glass Sheets Grip Building Materials

A method of creating a permanent bond between glass and building materials such as concrete, cement, stucco, etc., has been developed by Glass Construction Industries of Los Angeles, Calif., and is being made available to contractors by E. Baird & Associates, 127 S. Broadway, Los Angeles, Calif.

The glass sheets, in 1-foot sizes or smaller, come in a variety of colors and patterns. They are said to be durable, easily applied, and economical. A group of tests performed by an independent agency showed that the bond surpassed the strengths of the individual materials to be bonded.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 137.

REX WINCHES *Save you* Time, Money, Labor

JUNIOR TRUCK WINCH
Weight 186 lbs. Ratio 32 to 1
Height 9" Lift 1000 lbs.
Length 30" Width 10"
Plate drilled to fit standard truck frame. Oil sealed bearings, stainless steel brake band. Spool capacity 400 ft. 5/16" cable. Winch runs from power take-off. Sizes 5 to 7½ ton capacity.
JUNIOR COMPOUND POWER WINCH
Weight 140 lbs. Ratio 90 to 1
Length 28¼" Lift 1000 lbs.
Height 10¼" Width 10"
Equipped with clutch and brake. Spool capacity 200 ft. ¼" cable. A portable machine. Use with ½ or 1 H.P. Motor. 5 and 7½ ton size.
JUNIOR HAND OR POWER WINCH
Weight 60 lbs. Ratio 32 to 1
Length 12" Lift 1000 lbs.
Height 6" Width 8"
Spool cap. 100 ft. ¼" cable. All gears in oil. Has 3/16 key way for power drive.
JUNIOR POWER WINCH
Weight 78½ lbs. Ratio 33 to 1
Length 12¾" Lift 1000 lbs.
Height 8¼" Width 8½"
Spool cap. 150 ft. ¼" cable. Oil sealed bearings. Write for complete Catalog.

REX MACHINE CO., 1152 Turner Ave., Grand Rapids, Mich.

ALL "SET" TO SERVE IN 72 HOURS with Fulco COTTON Concrete-Curing MATS

Fulco Cotton Concrete Curing Mats save taxpayers money by increasing the life of roads during the first 72 critical hours, when concrete is setting and curing. Fulco mats stay wetter longer with less water, insulate fresh concrete from sudden temperature changes. They're preferred and approved for state and Federal highway construction, because they cure concrete better and quicker.

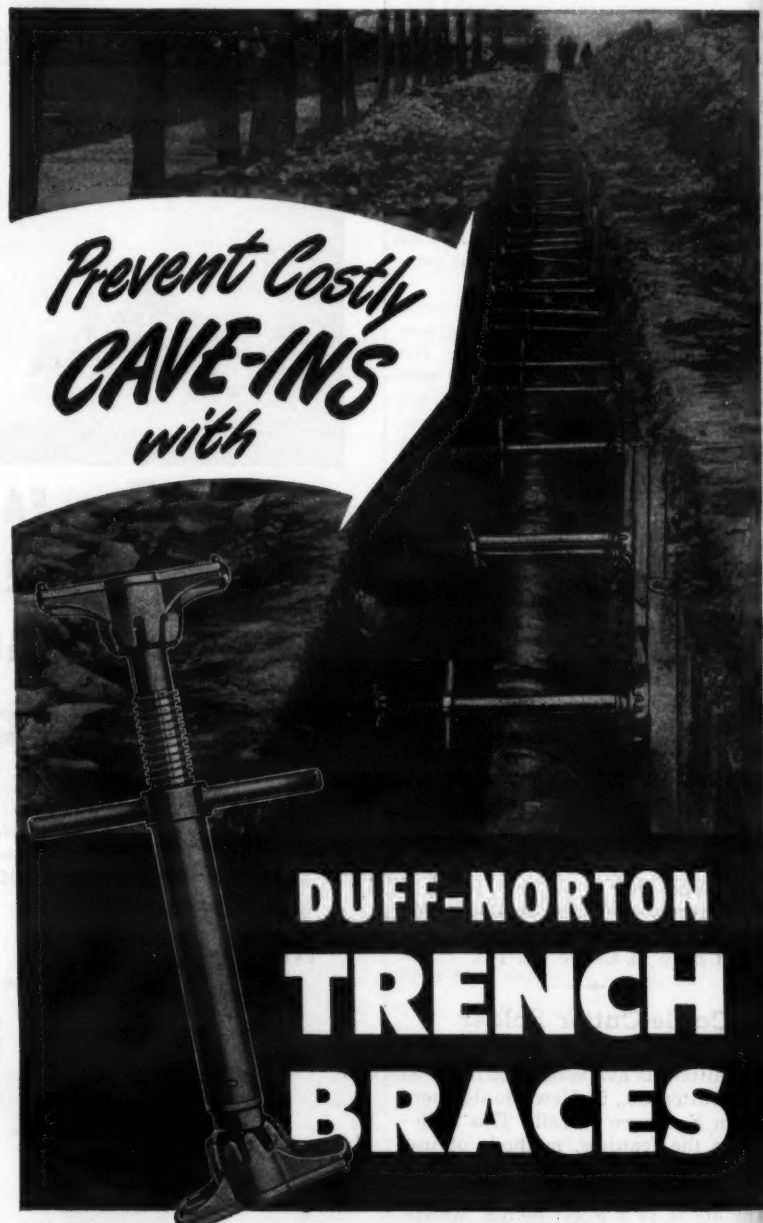
FULCO MATS USABLE MANY, MANY TIMES

The per job cost of using Fulco Cotton Mats is negligible, because they can be used again and again. Sturdily made with tough cotton fabric with stitched edges and seams, Fulco mats are filled with cotton padding weighing 12 oz. per sq. yd. Edges are stitched on a 6" flap along the long side to assure complete overlap from mat to mat.

Every contractor needs Fulton Triple-Strength Tarps of 1,000 uses, for protecting machinery and supplies from elements of the weather.

Write for Price List.
Address Nearest Factory Branch.

Fulton BAG & COTTON MILLS
Atlanta • St. Louis • Dallas • Denver
Kansas City (Kans.) • Minneapolis • New Orleans • Los Angeles • New York, 434 Broadway • Winter Haven (Florida)



Make Trenches Safe for Workmen

Dependable Duff-Norton Trench Braces hold walls of trenches firmly in place while pipe is being laid, or construction work completed. Easy to install, easy to maintain when not in use, they are the most economical trench supports on the market. Write today for complete data and proposal on your requirements.

See Your Associated Equipment Distributor.

THE DUFF-NORTON MANUFACTURING CO.
MAIN PLANT and GENERAL OFFICES, PITTSBURGH 30, PA. — CANADIAN PLANT, TORONTO, ONT.
"The House that Jacks Built"

Dredging Improves New Haven Harbor

Over 5,000,000 Yards Are Pumped on Shore to Fill In Swamps and Lowlands, And to Restore Beach

✦ THE spacious and deeply indented harbor at New Haven, Conn., on Long Island Sound is being improved by deepening its ship channel entrance from 25 to 35 feet. When the project is completed this summer, approximately 5,200,000 cubic yards of material (place measurement) will have been dredged from the harbor bottom. This material is being placed as hydraulic fill at several locations around the sides of the harbor, to fill in swamps and lowlands, and to widen and restore valuable beach areas that have suffered from erosion.

Work on the harbor improvement began in April, 1948, after the Department of the Army, Corps of Engineers, New England Division, awarded a contract to the American Dredging Co. of Philadelphia, Pa., on its low bid of $1,752,400. The contract begins at the deep waters of Long Island Sound, more than a mile beyond the gap in the two protecting breakwaters, and extends nearly 5 miles northwards into the harbor. It terminates where the new channel meets an area around the wharfs and docks that had previously been dredged to the same 35-foot depth under a prior contract.

Actually the new channel is being dredged to a depth of 36 feet at low water, or a foot greater than the specified depth, in order to insure the removal of any high spots over the 35-foot channel depth. The old channel was 25 feet deep, so a cut of at least 10 feet was required over the entire area. Where the channel was relocated away from the original alignment, the dredging was naturally much deeper. The maximum depth of cut was around 16 feet, with the average between 10 and 12 feet.

The new channel has a width of from 400 to 500 feet. At the northern end of the contract near the docking berths, a previous contract had widened the channel to 800 feet. Little widening was required over most of the old channel except at the new locations near the north and south ends of the contract. The project consisted essentially of deepening the existing channel, and eliminating a couple of sharp-breaking angles in the ranges. Navigation is thereby aided, and the big oil tankers, coal colliers, and freighters will be able to pass from the deep waters of the Sound swiftly and easily up the new channel to the docks of downtown New Haven.

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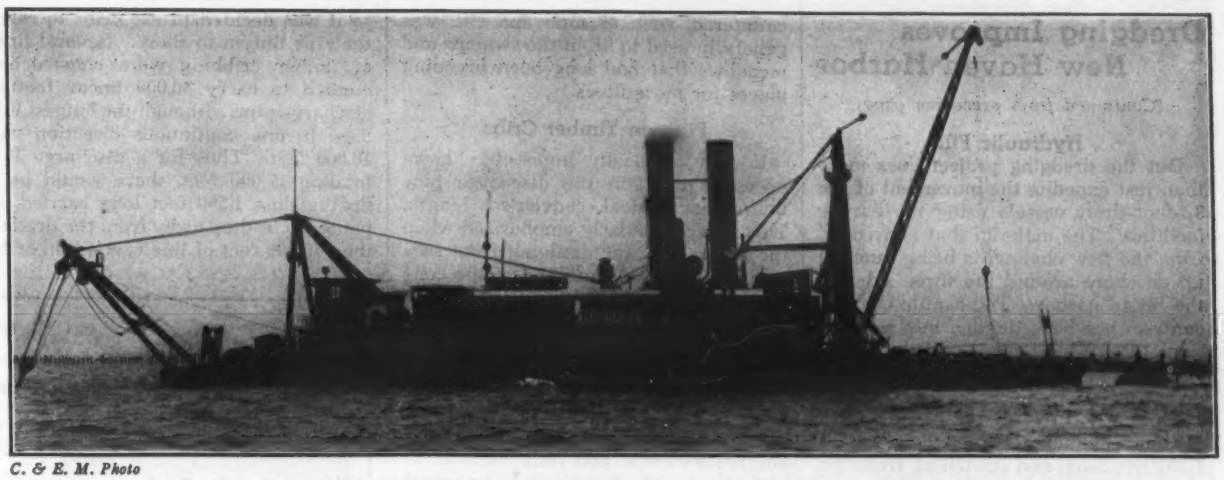


C. & E. M. Photo

On the New Haven harbor job the American Dredging Co. uses its steam-powered dredge Pennsylvania.

For Construction Maintenance and Repairs

PUNCH-LOK

HOSE CLAMPS AND FITTINGS

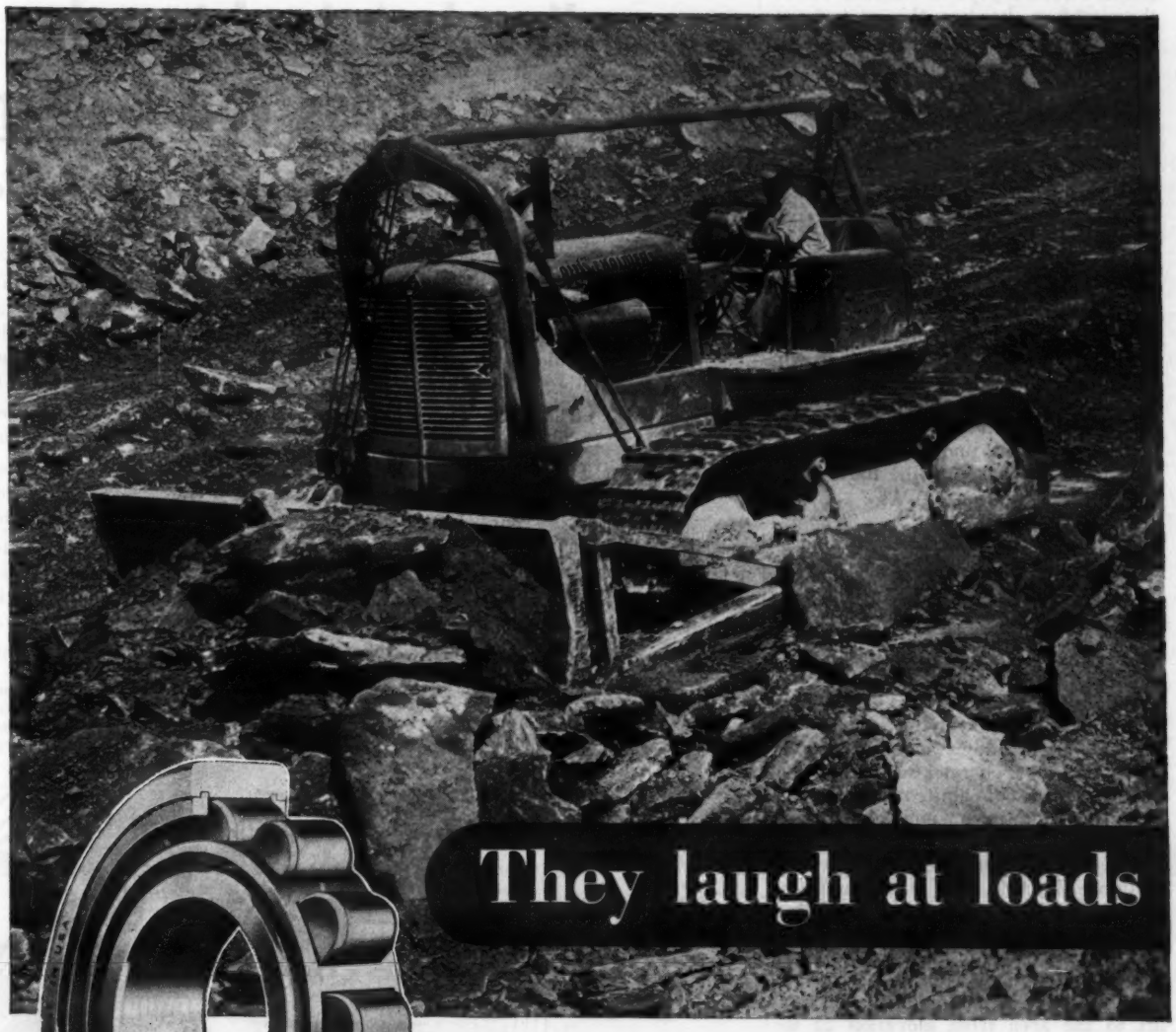
LOOK—It's locked for Safety

Today's Best Bet For Leakproof Hose Connections

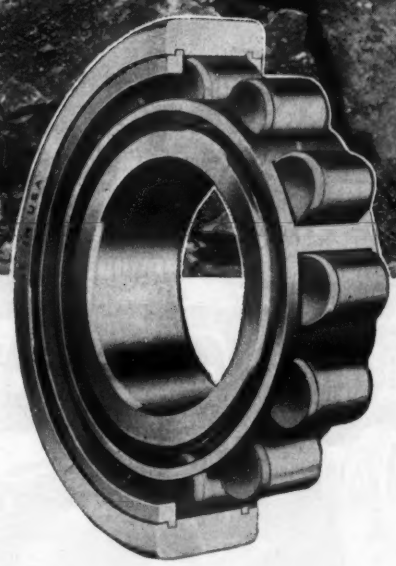
Write for Catalog and Air Leak Cost Chart

PUNCH-LOK COMPANY

Dept. A, 321 N. Justine St., Chicago 7, Ill.



They laugh at loads



In the Allis Chalmers Crawler Tractors, Hyatt Roller Bearings are used in the transmission, controls and final drive, a typical example of Hyatt equipped construction machinery.

It doesn't matter what kind of road building or maintenance equipment you build, sell or buy, it will pay you to be sure it is equipped with Hyatt Roller Bearings, because Hyatts are built to take heavy loads.

Long life, profitable operation, and no time out on the job have earned for Hyatt Roller Bearings the highest respect of contractors and road builders everywhere. Because they are designed and built to carry the heavy loads, Hyatt Hy-Load Roller Bearings are outstanding as the first choice of equipment builders. Hyatt Bearings Division, General Motors Corporation, Harrison, N. J.

HYATT ROLLER BEARINGS

Dredging Improves New Haven Harbor

(*Continued from preceding page*)

Hydraulic Fill

But the dredging project does more than just expedite the movement of the 32-foot-draft vessels using the harbor facilities. The material that is dredged from the new channel is being pumped up on shore around the three sides of the broad harbor. The 5-mile channel contract has been divided into six sections of varying length, and the material from each section is pumped to a definite spoil area for use as hydraulic fill.

Thus channel section No. 1, about 7,500 feet long, and stretching from the deep waters of the Sound to a point well inside the breakwaters, will yield an estimated 1,500,000 maximum pay yardage for use on the West Haven shores. This disposal area, No. 1, is about 2 miles long, and includes Savin Rock Beach which had been narrowed down to almost nothing at high tide. Beach Street, a popular summer-resort thoroughfare, borders this waterfront area. Clean white sand has now been pumped ashore to form a smooth beach 200 feet wide, with a maximum elevation of 10, and pitching towards the water with a 1 on 35 slope.

Another small area around Old Field Creek in this section has also been filled in. This was a section of swampland owned by the Town of West Haven, which cooperated in the land-reclamation aspect of the project by constructing an earth dike to elevation 15 in order to retain the hydraulic fill. As the land is located in back of the road bordering the beach, the Town also installed three lengths of 48-inch-diameter concrete pipe to serve as sluices. They conveyed the water from the disposal area under the dike and road to drain back into the harbor.

Road Material

Channel sections Nos. 2, 3, 4, and 5 were all dredged to disposal areas east of the harbor. Section No. 2, totaling 100,000 yards, went into the building up of Lighthouse Park Beach. Section No. 3 was pumped behind the beach, yielding 250,000 yards for filling in Lighthouse Park Meadows. Still further inland, the low-lying swamps of East Haven Meadows acquired 1,050,000 yards from channel section No. 4. Section No. 5 contributed 600,000 pay yards for building up and leveling off the East Shore Park area.

The greatest yardage from any one section—1,700,000—was dredged from section No. 6, at the north end of the contract, for disposal in what is known as the Long Wharf area along the New Haven waterfront. This is a second-stage filling operation, adding a 10-foot lift to the area from elevation 10 to elevation 20. The 4,500 x 2,000-foot irregular-shaped tract had already been filled in to elevation 10 with 3,563,662 cubic yards of hydraulic material by the Arundel Corp. of Baltimore, Md., under a previous dredging contract with the Corps of Engineers. Some time in the future, this filled-in land will provide a new roadbed for relocated U.S. 1. The new alignment will veer off from congested downtown New Haven and skirt the northern shore of the harbor on the new fill. A new high bridge will also be constructed to carry the highway over the stream at the upper end of the harbor dividing New Haven from East Haven.

The contract was divided into sections with two thoughts in mind: to keep the discharge pipe line from the dredge as short as possible, and to provide the material best suited for the different disposal areas. About 90 per cent of the material pumped up for the beach on the West Haven shores was a clean, hard, grayish-white sand. The less desirable material that was encountered, such as mud and silt, was generally used to fill in the swamps and meadows that had long been breeding places for mosquitoes.

Pipe on Timber Cribs

It was physically impossible, however, to maintain the discharge pipe line at some ideal, convenient length. This was particularly emphasized when the contractor was dredging from section No. 1 at the south end of the contract, well out beyond the mouth of the harbor. The American Dredging Co. chose to begin operations on this No. 1 section of channel so as to complete it before the really rough winter weather set in; for this south stretch of the job was outside the protection of the harbor breakwaters, and fully exposed to any storms or strong winds sweeping the Sound.

From the section No. 1 location, the discharge line averaged 17,000 feet from the dredge to the beach. Maintaining a floating line of any considerable length was impossible in these waters, so it was decided to use cribs to carry the pipe line in to shore. Several lines of timber cribbing were constructed, enough to carry 30,000 linear feet of discharge pipe, although the longest line used in one continuous direction was 10,000 feet. Thus for a discharge line totaling 17,000 feet, there would be a floating line 1,500 feet long carried on pontoons leading away from the dredge, then 10,000 feet of line carried on cribbing, with the remaining 5,500 feet made up of shore line.

Construction of the cribbing was sublet by the American Dredging Co. to the New England Dredge & Dock Co. of New Haven which began operations in April, 1948. By July, enough crib lines were built and pipe strung to permit the dredging to get under way. The cribs were laid out on 14-foot cen-

(*Continued on next page*)

There's Always a **BEST WAY**

That goes for snow clearance, too. It's no mere accident that

DAVENPORT-FRINK SNO-PLOWS

enjoy engineer-preference throughout the snow belt. They have won their spurs through Faster • Safer • Cleaner Snow Removal.

PLAN AHEAD

The best time to think about increased efficiency for next year is NOW. We'll gladly supply complete information.

ALL SIZES and TYPES for TRUCKS ● TRACTORS ● MOTOR PATROLS

DAVENPORT BESLER CORP.

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Made in Eastern U.S.A. by CARL H. FRINK, 1000 Islands, CLAYTON, NEW YORK

You don't lead in sales for 17 years unless you lead in value!

International Trucks have led in heavy-duty truck sales for 17 straight years!

WHAT HEAVY-DUTY TRUCKS offer the biggest value? The most exacting truck buyers in America have answered that one.

You can find their answer by looking at registration figures for new trucks with gross weight ratings of 16,001 pounds or over.

Those figures show that International Trucks have been *America's largest-selling heavy-duty trucks for 17 straight years!*

A heavy-duty truck is a major investment. You can bet your bottom dollar that the men who buy them don't give any line of trucks a vote of confidence like they've given International unless their profit and loss statements show them that it pays.

But don't think that International Trucks offer outstanding value in the heavy-duty field *alone*. There are 22 models of International Trucks plus 1000 different specialized variations to meet individual hauling requirements. Gross vehicle weight ratings range from 4,400 to 90,000 pounds.

Trucks built to meet your specifications—No matter what model International Truck you buy, you get the basic values that have made International Trucks the largest-selling heavy-duty trucks in America for the past 17 years.

You get a rugged truck unweakened by a single compromise with passenger car design.

You get a long-lasting truck. *More than half of all the Internationals built in the last 42 years are still on the job.*

You get a truck specialized to meet your particular specifications; specified by a truck sales engineer who knows your business in terms of the demands it makes on trucks.

See your International Truck dealer or branch.

International Harvester Builds
McCormick Farm Equipment and Farmall Tractors
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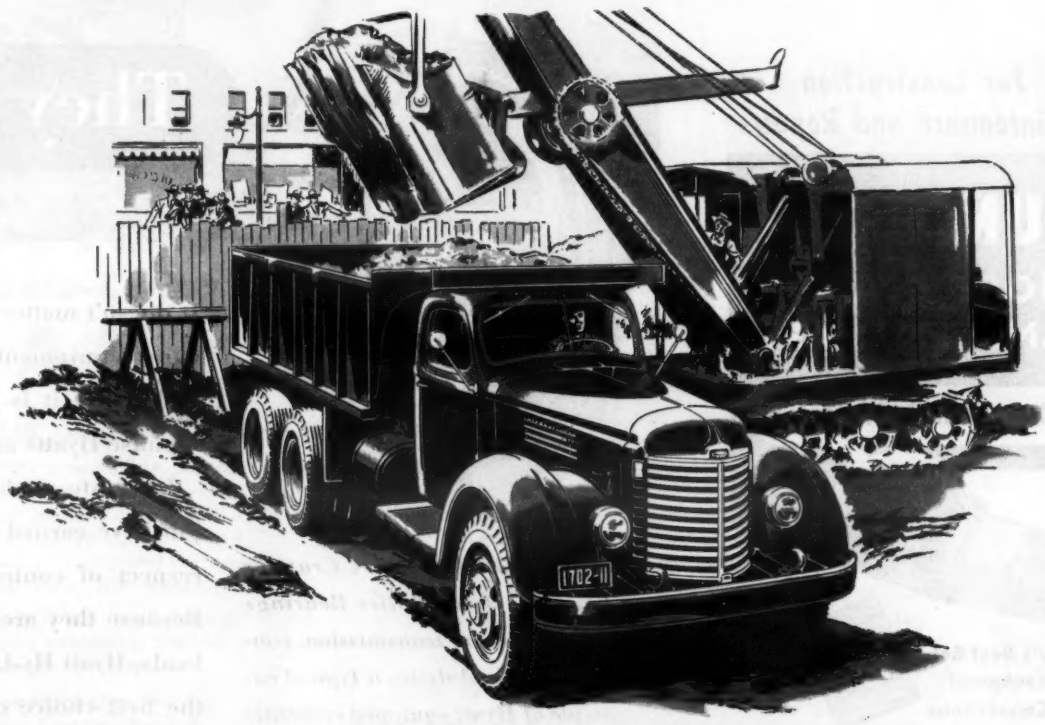
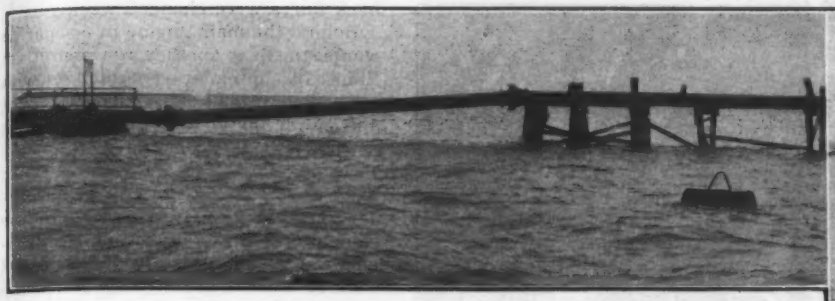
Refrigerators and Freezers



INTERNATIONAL TRUCKS

INTERNATIONAL HARVESTER COMPANY • CHICAGO

FIRST IN HEAVY-DUTY TRUCK SALES FOR 17 STRAIGHT YEARS



C. & E. M. Photos

Two shots of the Pennsylvania's floating pipe line—at left, the spot where it leaves its pontoon support for cribbing; and above, a view from the stern of the dredge. Notice the safety sign.

ters, and consisted of two timber piles, from 40 to 65 feet long, driven about 5 feet apart to form a bent. At the 12 elevation mark, which is 12 feet above low tide, the pair of piles were joined together with two 3 x 12's, one on each side and bolted to the piles. These crosspieces supported the 16-foot lengths of 27-inch ID discharge pipe which were laid down the center of the cribs and connected to each other by slip joints.

A boardwalk ran over the trestle alongside the pipe line. The walk was made of 18-foot lengths of 3 x 12's which were spiked together at each crib where they overlapped. This runway also served as a longitudinal bracing for the cribwork.

Discharge Line

Directly off the dredge the floating discharge line consisted of two 56-foot lengths of 27-inch ID steel pipe which were joined together with a flange connection to form a single rigid length of pipe. These sections were connected with flexible ball joints. Including the joints, each floating length of pipe measured 115 feet, and was supported on four steel pontoon tanks with a pair of tanks near each end of the pipe section.

The tanks were cylindrical, measuring 24 feet long x 6 feet in diameter, and were placed 30 feet apart in pairs to support the pipe which was laid on top at right angles to the long dimension of the cylinders. They were joined together near their ends by 12 x 12 timber strongbacks. At the center of the tanks were steel saddles in which the pipe was laid securely and held by two long bolts passing through 12 x 12's on top of the pipe. Covering the pipe was a wooden catwalk made of two 2 x 12 boards for a runway, with a protecting handrail of 2 x 4's on one side. The catwalk also carried a ship-to-shore telephone line so that the dredge could keep in touch with the pipe-setting crew on the beach.

At the end of the floating line a single length of 56-foot pipe ran up to the trestle cribbing, and the rest of the pipe, over water and on land, was in 16-foot lengths with slip-joint connections. After the pipe left the cribbing and gained the shore, a Y-connection was installed for spur lines to run out on both sides from about the mid-point of the beach. In this way the beach was widened both ways from the center to the ends. As the beach was built up,

(*Continued on next page*)

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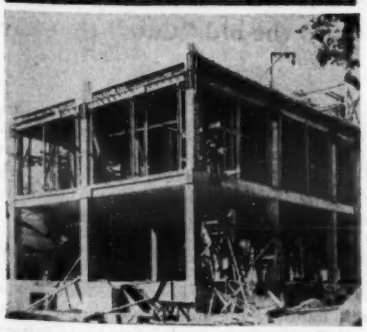

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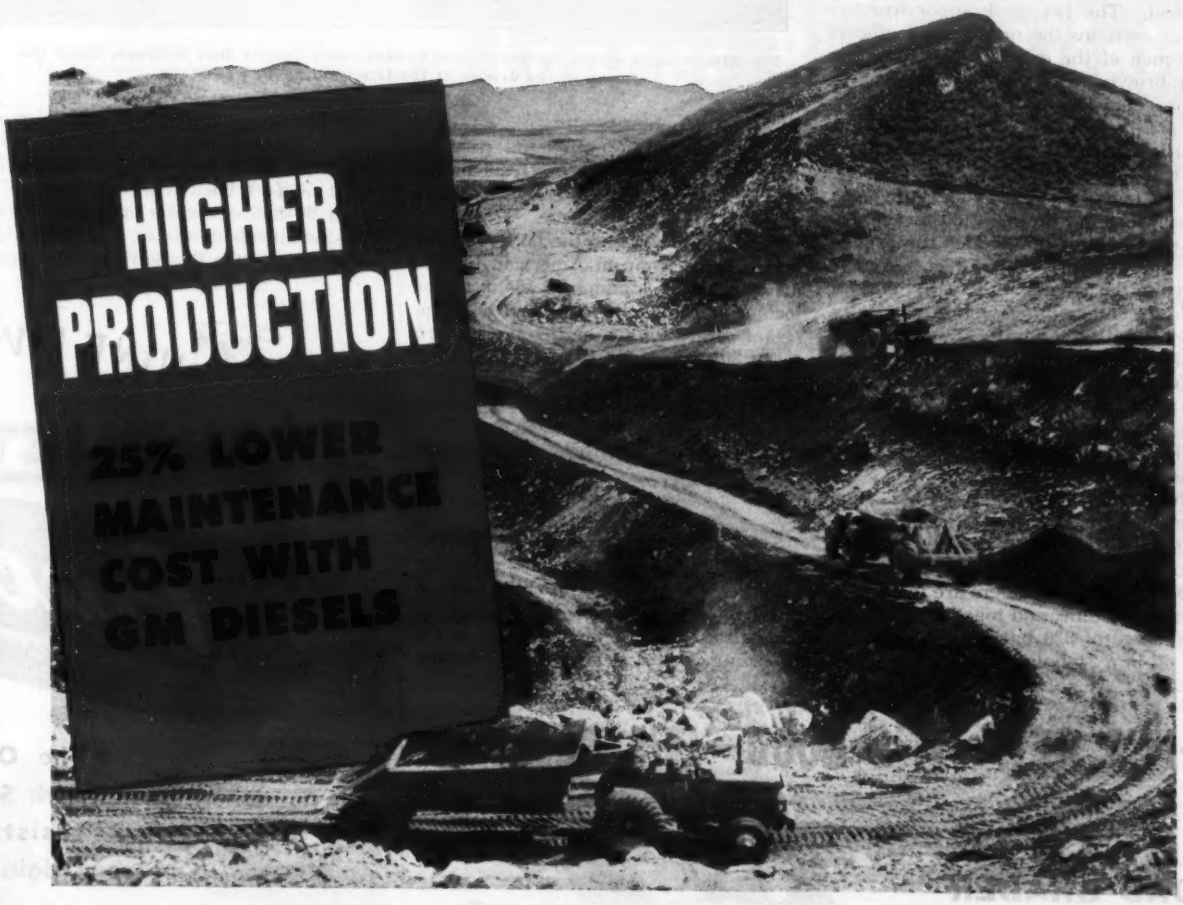

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Dredging Improves New Haven Harbor

(*Continued from preceding page*)

additional sections of pipe were added to the shore line. A baffle plate was installed at the end of the discharge pipe to soften the force of the flow and prevent wash of material. A shore crew handled and set the land pipe.

In placing hydraulic fills on the meadow lands, the contractor built small retaining dikes behind which the material was pumped. Sluices were installed in these barriers to let the water flow back into the harbor and the heavy material dry out.

Dredge Pennsylvania

On the New Haven harbor job the American Dredging Co. used its steam-powered dredge Pennsylvania, with a 33-inch intake on the main pump and a 27-inch discharge. It was built for the American Dredging Co. in the Sun Ship Yards, Chester, Pa., in 1934; has seen service along the east coast in the Delaware River, Chesapeake and Delaware Canal; and played a part in the dredging at the National Airport, Washington, D. C. The Pennsylvania is 165 feet long and has an all-steel hull of ⅝-inch plates, a 50-foot beam, and a depth of 14 feet. The two-deck superstructure which contains the quarters for officers and men of the crew is painted cream and brown. On the decks all stanchions, niggerheads, and exposed gear are painted a bright yellow to signalize attention and thus prevent accidents.

At the bow of the Pennsylvania is the 65-foot 160-ton ladder supported on an A-frame towering 30 feet above the deck. With this ladder the dredge can dig to depths of 55 feet. At the stern of the dredge are two spuds on 15-foot centers which move vertically in wells within the hull. The spuds are steel cylinders 36 inches in diameter x 65 feet long, and weigh 30 tons each. The working spud is on the starboard side, while the port spud moves the dredge ahead by a series of swinging steps.

Steam for the dredge operations is generated by two Babcock & Wilcox marine-type water tube boilers, each of which is fired by four B & W mechanical oil burners. Both boilers are in service at the same time, and together consume an average of 320 barrels of bunker C fuel oil in a 24-hour working day. Fuel oil is obtainable locally, placed in a 3,700-barrel steel barge, and pumped from the barge into the 1,450-barrel storage tank in the hull of the Pennsylvania.

C. & E. M. Photo
The Elliott main steam turbine of the Pennsylvania dwarfs Otis Sullivan, Chief Engineer on the dredge at the time this photo was taken.

Air is admitted into the boilers under forced draft from an American blower driven by a Westinghouse 15-hp motor located on top of each boiler. The steam safety valves of the boilers are set at 301-pounds of pressure, but they usually operate at 265 pounds of steam. When the dredge is pumping heavy material over a long discharge line, however, this pressure has been boosted to 275 pounds.

Steam-Driven

Steam from the boilers drives the Pennsylvania's main power unit, an Elliott 4,500-hp steam turbine, which turns the main suction dredging pump through a 10 to 1 reduction gear and a Kingsbury thrust bearing. The American Dredging Co. centrifugal pump, with a 33-inch suction and a 27-inch discharge, is in the center of the hull, about 50 feet back from the bow. It has a 90-inch-diameter impeller, with a 21-inch inside diameter, and walls 1½ inches thick. On this job the front and back liners were changed weekly.

Behind the main engine in a separate compartment is another power unit, an Elliott 792-hp motor-generator set with a 700-kw rating. This furnishes light and power for all the other operations of the dredge except the main pump. Two stand-by units, however, are on hand—a 15-kw steam-driven motor-generator set to furnish power for the machine tools used in equipment maintenance, and a Winton 12-kw diesel generator set to furnish power for the lighting system if the boilers should be shut down. Shop tools include a Stanley grinder, three Van Dorn electric drills, and the usual vises and hand tools; a long workbench is set up inside the housing on the main deck.

The 700-kw generator furnishes electric power for two Elliott motors with important functions to perform: a 500-hp unit that drives the cutter head, and a 150-hp motor that operates the swing gear. The cutter-head motor, in the bow of the dredge at the base of the ladder, turns at 600 rpm and drives the cutter head through a 13 to 1 Farrel-Birmingham reduction gear. Forward of the pump is the swing-gear motor which runs a Bucyrus-Erie five-drum winch—three drums in the front bank and two in the rear. The center drum forward raises and lowers the ladder, and is flanked on either side by the starboard and port swing drums. Behind the swing drums are the starboard and port spud drums. Out to the sides from these spud drums are cat wheels to which hauling lines for various functions may be attached. The cat wheels are just outside the deck housing.

How It Operates

With its starboard working spud

(*Continued on next page*)

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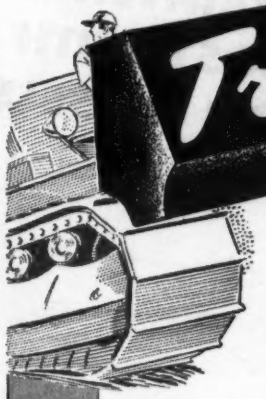

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C. & E. M. Photos

The shore crew of the Pennsylvania rolls a length of land discharge pipe line into position on Savin Rock Beach disposal area No. 1 (left). Above, the discharge end of the line.

lowered into the sands of the harbor bottom, the dredge, while it is pumping, swings back and forth across the channel on its swing line. The swing line is a 1¼-inch steel-wire cable, 600 feet long, secured to 10,000-pound anchors which are dropped off on each side of the dredge. Thus from this line, the dredge can pump across a strip 300 feet wide, although on this job the average length of swing was 275 feet. The usual procedure was first to dredge half the width along a portion of the channel, then back the dredge to the point of beginning and pump out the remaining half of the channel width. In dredging section 1 of the channel, the Pennsylvania started in at about the midway point of that outer stretch, and worked towards both ends.

The channel was dredged usually in 500 to 700-foot strips, first on one half and then on the other, and only half the full depth at a time. This prevented adjoining material from running down the slopes and filling up the cut, as would have been the case if the full depth had been dredged at one pass. Thus if a 12-foot cut was required, 6 feet of channel bed was removed at the first pass, and the remaining 6 feet at the next pass. Then when the dredge had finished pumping, a cross-section survey was made to determine the amount of material excavated so that payment could be made to the contractor.

At the forward end of the ladder, working from a drive shaft running out from the cutter-head reduction gear, is a spider-type cutter head. Spiders with both five and six blades were in use on the New Haven job; the five-blade heads for the finer, easier digging material, and the six-blade heads in the denser, hard-to-cut and more consolidated bottom. The material excavated included silt, a small amount of gravel, shells of all kinds, and boulders—but most of all a harsh, abrasive sand that was tough on the cutter-head blades.

Several spare spiders were always available on the job, and about every two weeks the head was removed for re-blading. A reconditioned spider head was slipped into place on the ladder, while new blades of manganese steel were riveted to the cutter head just removed. All these replacements were done right on the job by a couple of work barges. One of these was a small barge constructed of pontoon tanks, which carried on its deck a Lincoln 300-amp electric welder driven by a Buda gas engine.

Similar work was also handled on the deck of a steel water barge with a capacity of 60,000 gallons. This barge carried water, bought at the Terminal Dock in New Haven and towed out by tug to the dredge, which has water-reserve storage tanks with a capacity of 30,000 gallons. At one end of the water barge is a blacksmith shop complete with anvil, forge, and heavy tools, together with another Lincoln 300-amp electric welder also driven by a Buda gas engine.

Pumping Material

Directly behind the bottom half of the cutter head is the open end of the 33-inch intake pipe which runs up the ladder and enters the dredge hull just above the water line through a 15-foot rubber sleeve connection. In front of the pump the steel pipe contains a manhole for catching debris which can then be removed from the line before it enters the pump and damages it. The lid of the manhole is easily lifted off with a Yale 5-ton hoist hung from an overhead cross beam.

The 27-inch discharge line leaves the pump on the starboard side and slopes upward to the level of the main deck. At the side a right-angle turn sends the pipe back along the starboard deck to the stern. There it makes a slight

(*Concluded on next page*)

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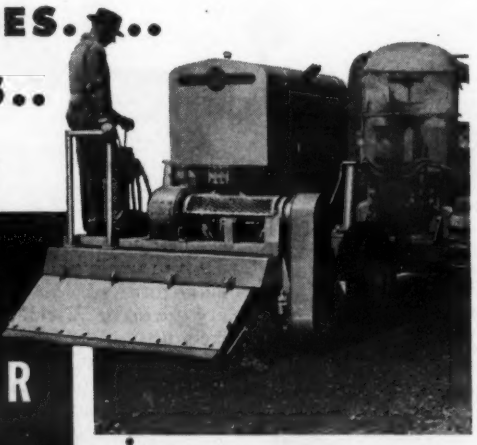

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Dredging Improves New Haven Harbor

(*Continued from preceding page*)

reverse curve to a swivel connection where it leaves the dredge for the pontoon line. With this material, the dredge pumped 12 per cent solids on the average, except on the long discharge lines from section No. 1 where the average solids dropped to 10 per cent. On such long-distance pumping the dredge averaged around 12,000 cubic yards in a 24-hour day. As the discharge line shortened, with the dredge moving closer to the disposal areas on shore, the yardage increased to an average of from 40,000 to 50,000 cubic yards per 24-hour day.

The operations of the dredge are controlled from the lever room, high above the deck overlooking the bow. There the leverman, or dredge operator, is stationed between two banks of levers, one set on his left or port side and another on his right or starboard side. The port bank has six levers—two for the ladder, two for the port swing line, and two for the port spud. The levers are in pairs—one for the friction control and the other for a brake on the running of the cable lines. The starboard bank of four levers regulates the spud and swing lines on the starboard side of the dredge.

In addition to the levers, there are also two control switches on each side of the leverman as he looks out over the bow. The cutter-head control is at his right hand, while at his left hand is the control for the ladder, swing lines, and spuds. Three gages on the port side of the cabin indicate the steam operating pressure, the vacuum on the pump, and the pressure on the discharge line. The steam pressure varies between 265 and 275 pounds, and the vacuum from 6 to 10 inches, while the pressure on the discharging material ranges from 150 to 170 pounds, with higher pressures recorded on the longer lines. No auxiliary boosters were needed, however.

A glance out of the bow window shows the leverman the depth at which the ladder is working as recorded on a gage fastened to a cross member of the A-frame. The operating control room also contains the switches for the floodlights which are turned on for night operations. Here also is one end of the ship-to-shore telephone line, and a radio telephone that connects with the regular telephone lines on land.

Other Equipment

Behind this control room on the upper deck is a hatchway directly above the main pump deep in the hold of the dredge. An I-beam crosses above this hatchway to serve as a runner for a pair of Peerless 8-ton hoists. Through this opening, the pump, or sections of it, may be removed for replacement or repair. The hoists usually slid the hatchway off to the port side where a derrick barge was moored. The boom was then swung over the dredge, and the pump parts were lifted out and lowered to the deck of the derrick or work scows. This was the quickest way of handling pump replacements. But if the derrick was not available, the hoists could readily remove a plate section from the upper deck, lift out the parts, and swing them over the side of the dredge and lower them to the deck of the work scow.

On these upper decks are the quarters of the dredge crew which numbers 70 for the three shifts—8 a. m. to 4 p. m., 4 p. m. to midnight, and midnight to 8 a. m. The shore crew, totaling 40, also works three shifts. Meals for the dredge crew are served in the galley on the main deck near the stern. A modern refrigerator permits the storage of large supplies of fresh meats and vegetables.

On the starboard side of the main engine is the condenser, and a Westinghouse switchboard for the distribution of power and light throughout the dredge. Across from the switchboard is a panel of Esterline-Angus graphic instruments which record the vacuum and the pressure on the main pump through its full operating time. On this level an Elliot de-aerating heater is located.

On the lower deck in the hold are various storage tanks for turbine oil, kerosene, motor oil, and also an oil cooler for the main engine. Here, too, are 13 Lecourtenay evaporator steam pumps for the turbines, and an Ingersoll-Rand air compressor which supplies air for general cleaning purposes.

Other floating equipment includes a derrick barge used in pump overhauls and for shifting the anchors on the swing line. The steel hull on the derrick measures 95 x 40 feet and has a 3-foot draft. The steam boiler burns coal and its 70-foot boom has a 20-ton capacity. Equipment, supply, and work barges are moved about by two company tugs, deep-maroon in color. They are the Salem, a 50-foot craft with a 13-foot beam and a 7-foot hull, powered by a Buda 165-hp diesel engine; and the Emma R., 61 feet long x 17 feet in the beam, with an 8-foot 9-inch hull. The later is driven by a Fairbanks-Morse 240-hp diesel engine.

Ferry service back and forth to New Haven for the dredge crew is provided by a hired cabin cruiser, the Ambrose, 44 feet long and operated by a Mack 140-hp marine diesel engine.

Personnel

The American Dredging Co. is represented on the New Haven, Conn., harbor project by Edward Keszler, Superintendent; Captain C. R. Boyer, Master of the Pennsylvania; Joseph Albrich, Chief Engineer of the dredge; and Vance Mitchell, Timekeeper. A. B. O'Quinn is Chef on the Pennsylvania. Joseph Chicosky is General Foreman on the pipe-line work.

For the Department of the Army, Corps of Engineers, New England Division, John J. Hynes is resident Engineer; John McIlroy, Robert J. Bolger, and Michael J. Dolan are Inspectors on the dredge. The New England Division is headed by Col. James H. Stratton.

W. L. Kennedy Dies at 48

W. Lawrence Kennedy, Sales Manager of The Sisalkraft Co., Chicago, Ill., died recently as a result of complications following an operation. Mr. Kennedy, who was also a director of the company, was 48 when he died.

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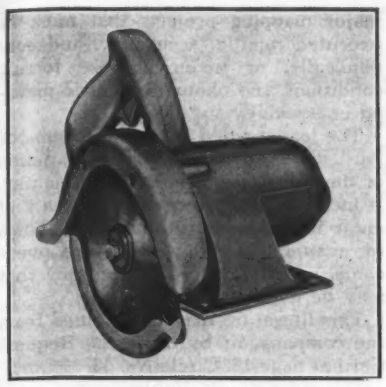

The Home-Utility 6-inch saw cuts wood, slate, tile, marble, or ceramics.

Utility 6-Inch Saw

Another new tool, the Home-Utility 6-inch saw, has been added to the line of portable electric tools made by The Black & Decker Mfg. Co., Towson 4, Md. Designed for a variety of uses, it is said to cut wood, slate, tile, marble, or ceramics to size. Its light weight, 9½ pounds, facilitates one-hand operation.

The motor is universal for use on 110-volt ac or dc current and delivers a no-load spindle speed of 5,000 rpm. The aluminum motor housing makes an extra hand grip when desired.

A feature is the stationary upper blade guard which is designed so that the blade may be watched from either side. The saw is equipped with a 2-pole trigger switch which, when it is released, turns the saw off instantly. Standard equipment includes a 6-inch combination blade; a cross-cut or planer blade and an abrasive disk are available as extra equipment.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 11.

A Terracing Grader

A new terracing grader is now being offered by the Duplex Mfg. Co., Omaha 10, Nebr. In addition to terracing work this light grader may be used for cutting and cleaning ditches for both drainage and irrigation, for filling washouts, and for other general soil-conservation operations.

The frame is of heavy channel steel, reinforced. The blade is adjustable and will throw the soil either way. The flanged wheels hold the grader on the side of a terrace or ditch and help to prevent side draft. The blade, 6 feet long and 14 inches wide across the cord, will cut 6 inches below the soil surface. The 6-foot terracer is standard; however, a 5, 6, 7, or 8-foot model may be obtained.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 13.

Loaders for Earth-Moving

A 24-page two-color catalog issued by The Euclid Road Machinery Co., Chardon Road, Cleveland 17, Ohio, is titled "Euclid Loader for High-Speed Loading of Large Loading Units". It describes some twenty actual jobs on which Euclid loaders have been used, giving figures on quantities to be loaded and average output. There are three on-the-job photographs for each account.

The center spread of the catalog presents ten features of the loader which are illustrated and explained with accompanying text.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 142.

New Turner Co. V. P.

The Turner Construction Co. announced recently that Edward X. Tuttle of New York City had been elected a Vice President in charge of new business for the company. He succeeds J. P. H. Perry, who continues as Vice President and consultant on new business. Though Mr. Tuttle's headquarters will be in Turner's New York office, 420 Lexington Ave., he will have general supervision of contract negotiations in the company's offices in Boston, Philadelphia, and Chicago.

Concrete Mixers

A new 3-yard horizontal Moto-Mixer has been brought out by the Chain Belt Co., 1600 W. Bruce St., Milwaukee 4, Wis. The company says that this model has all the features of the Rex 4½ and 5½-yard models, including chain drum drive, free-rolling drum mount, and accurate water system.

The company also announces the return of the Rex 56-S, a stationary 56-cubic-foot concrete mixer which was discontinued during the war.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 122.

Link-Belt Moves Offices

The Link-Belt Co., Chicago, Ill., announces that the following branch offices have been moved into larger quarters. The Cleveland office, headed by P. V. Wheeler, District Manager, is now located at 314 Hanna Bldg., Cleveland 15, Ohio. The Baltimore office, of which C. C. Wiley is District Manager, has been moved to 2315 St. Paul St., Baltimore 18, Md. The office in Huntington, W. Va., headed by D. W. Stevens, is now located at 1009 Fifth Ave.

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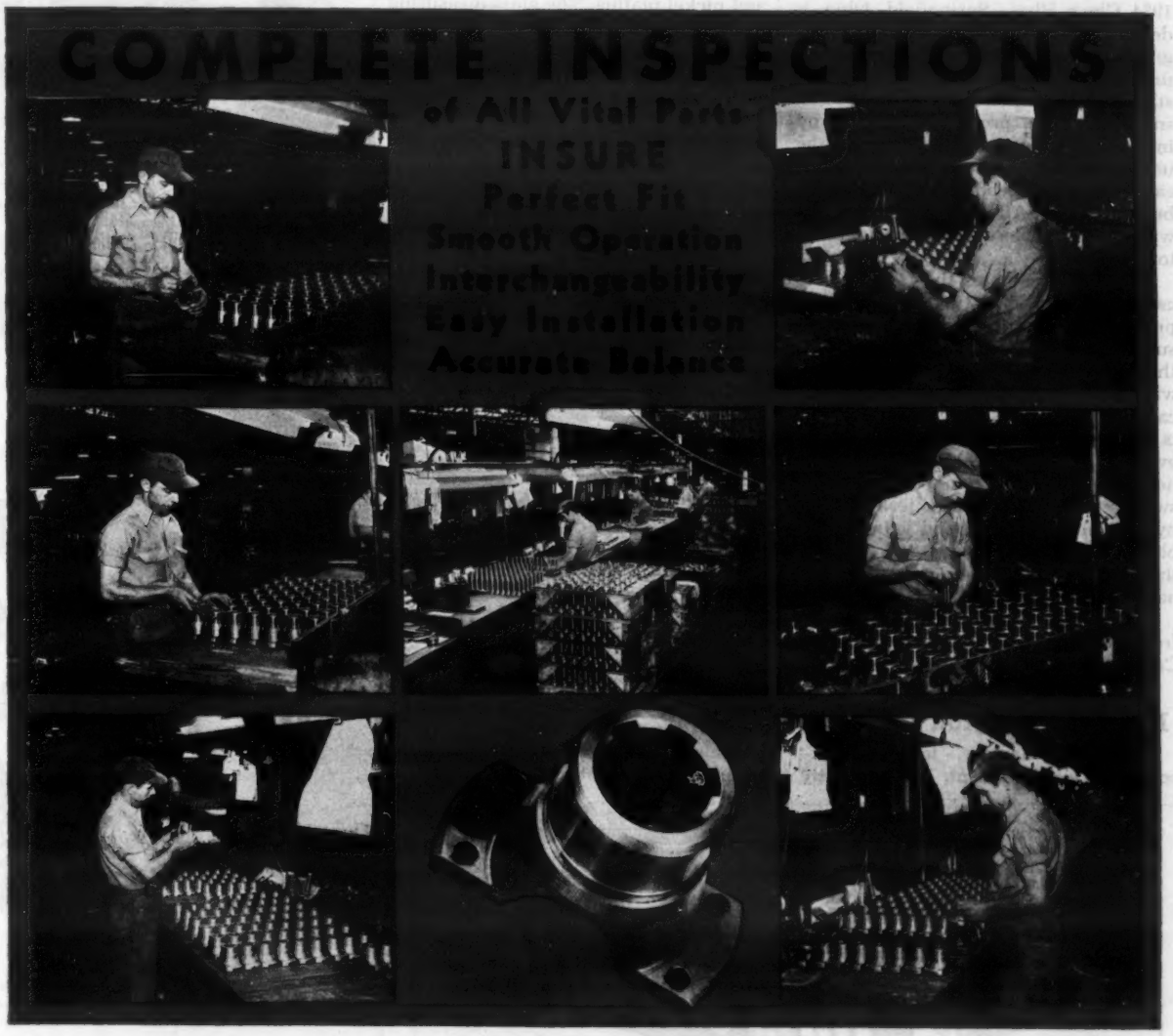

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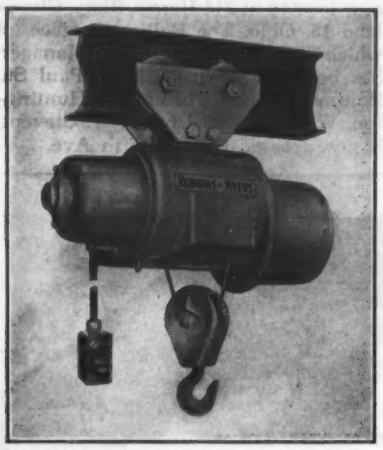

Designed for utility service, the Robbins & Myers Type J wire-rope hoist is suitable for stationary, hook, or trolley mounting. It is made in ¼, ½, and 1-ton capacities.

New Utility Hoist

The new Type J wire-rope hoist manufactured by Robbins & Myers, Inc., 1934 Clark Blvd., Springfield, Ohio, is designed, the company says, to meet the growing demand for a lower-priced unit for utility service. Suitable for stationary, hook, or trolley mounting in small shops, on production floors, and in receiving-dock and loading areas, the unit is available in ¼, ½, and 1-ton capacities with pendent rope or push-button control. All models are equipped with totally enclosed ball-bearing motors.

The company states that the electrically activated shoe-type motor brake provides instantaneous stopping and assures accurate spotting of loads; and that an oversize Weston load brake, with non-reversing clutch, automatically controls the speed when the load is lowered to prevent dropping in the event of power failure. Safety-enclosed hook blocks and drop-forged steel hook swivels prevent uneven or jerky lifting by eliminating twisted and jammed cables. Adjustable for various beam sizes, the trolley assemblies are equipped with ball-bearing wheels.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 4.

New Worthington Officers

Hobart C. Ramsey, formerly Executive Vice President, was recently elected President of the Worthington Pump & Machinery Corp., of Harrison, N. J. He succeeds Clarence E. Searle, who has been named Vice Chairman of the Board of Directors. Succeeding Mr. Ramsey as Executive Vice President is Edwin J. Schwanhausser, formerly Vice President in Charge of Sales.

John J. Summersby has been elected Vice President in Charge of Sales. Thomas J. Kehane was made Assistant Vice President and General Sales Manager. The two men have been with the company since 1916 and 1915 respectively.

Measures Entrained Air in Concrete Mix

An entrained-air indicator has been developed by the Central Scientific Co., 1700 Irving Park Road, Chicago 13, Ill. The Cenco device measures, by the pressure method, the percentage of air entrained in fresh concrete mixtures. Its capacity is 0.22 cubic feet. The bowl is made of drawn steel with a copper and nickel plating. The glass measuring tube is graduated from 0.0 to 8.0 per cent air, in 0.1 per cent divisions.

Concrete is placed in the bowl and struck off flush with the top. After water has been poured in above the concrete to the 0.0 mark, air is pumped into the space over the water column until a predetermined operating pressure is registered. The contraction in the volume of air in the concrete is shown by a lowering of the water in the graduated glass tube, the scale of which indicates the gross air content in per cent.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 141.

Catalog on Guardrail

Two bulletins are available from the National Traffic Guard Co., 215 Moreland Ave., N. E., Atlanta, Ga., on its Resiliflex highway guardrail. The folders describe the properties of the guardrail in use and picture it under severe test conditions.

Resiliflex guardrail is designed to receive the blows of heavy vehicles traveling at high speeds, to absorb the shock, and to guide the vehicles back to their proper courses with safety to the passengers. The bulletins stress the offset spring support of the road guard and the double-hinged articulated joints at the posts.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 28.

Mapping From the Air

A 4-page folder on aerial photogrammetry has been prepared by Lockwood, Kessler & Bartlett, Inc., 32 Court St., Brooklyn 2, N. Y. It points out that advantages of producing maps by photogrammetry are speed and economy, coupled with a degree of accuracy acceptable for a wide variety of work. For major mapping projects that must be executed rapidly, accurately, and economically, or under adverse terrain conditions, the photogrammetric method is especially suitable.

The leaflet titled "Mapping From the Air" gives an elementary explanation of the principles of aerial map making. It indicates the principal problems that enter into the interpretation of photos for mapping use, how they are overcome, and the degree of accuracy that may be expected.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 56.

Here's LOW COST Concrete Placing
GAR-BRO'S
PORTABLE HOPPERS
Save truck mixer time
• Speed work . . . twin center discharge gates fill twin lines of barrows or carts at same time.
• Frees trucks immediately . . . low height Gar-Bro hoppers can be filled from truck mixer without use of ramps.
• Non-clogging, self-closing gates . . . double clamshell type, 34 inches clearance from ground.
• Self-cleaning, bathtub shape hopper.
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Tops 'em all!
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Constant research and redesigning of Omaha Buckets has caused a saving of 25% of the total weight. This means a bigger load with an extra payload built in. With Omaha Buckets you move Dirt . . . instead of steel.
IN PROFIT
Omaha Buckets make every cast and load pay off with an extra payload. In all kinds of digging the job is done quicker, easier. Operators fill their daily quotas. You'll find that on the job and on the job record. Omaha Dragline Buckets pay off with a Profit!
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The Seventh of a Series in the interest of more efficient use of steel . . . a vital American resource
For the BEST ANCHORAGE don't put "square pegs" in "round holes"
Maximum annular grip develops when concrete set uniformly around a circular section.
Square reinforcing bar corners break the normal annular gripping of steel by the concrete.
USE LACLEDE MULTI-RIB REINFORCING BARS . . .
The advanced design of Laclede Multi-Rib Bars rolled to A.S.T.M. A 305-47T specification with round bar sections in all sizes assures improved anchorage with uniform concrete cover. Multi-Rib Bars have a high safety factor by combining anchorage ability well in excess of the A.C.I. recommendation of .10 fc with 65,000 p.s.i. yield point steel.
Round bar sections assure uniform clearance and coverage by the concrete.
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Write us about specifying LACLEDE MULTI-RIB BARS on your jobs.
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Producers of Construction Steel
LACLEDE STEEL COMPANY
St. Louis, Mo.

Avoid Legal Pitfalls

Edited by A. L. H. STREET, Attorney-at-Law

These brief abstracts of court decisions may aid you. Local ordinances or state laws may alter conditions in your community. If in doubt consult your own attorney.

Entitled to Extra Pay For "Changed Conditions"

THE PROBLEM: *Was the contractor on a Government airfield construction job entitled to additional pay on the ground that he had encountered unknown and latent subsurface conditions, within the meaning of a standard contract clause covering "changed conditions"?*

THE ANSWER: Yes, decided the United States Court of Claims. (Loftis v. United States, 76 Fed. Supp. 816.) The gist of the court's decision is as follows:

The specifications provided that unclassified excavation should include removal of all material encountered, regardless of type or class. But this clause, held the court, did not warn the contractor that unusual subsurface conditions existed, and it should be reasonably interpreted with the contract clause providing for additional pay for changed conditions.

The unstable subsurface conditions unexpectedly encountered involved an unknown and unusually high underground water table. This was apparently caused by the impervious character of soil about 10 or 15 feet beneath the original surface of depressions. There was nothing to indicate the condition and it could only have been discovered by borings. On the basis of the facts obtained and obtainable within the time allowed for submitting bids, neither the plaintiff nor the Government engineers had reasonable cause to believe that the condition existed.

Citing generally accepted rules of law, the court held that the purpose of specifications and drawings is to supplement the formal contract by delineating the details of the work to be performed thereunder, and not to void an express provision written into the contract. Contract provisions such as those involved in this case should be reasonably interpreted in the light of the known facts and reasonable knowledge possessed by the parties as to conditions. The intention of the parties is to be gathered not from a single sentence but from the whole instrument read in the light of the circumstances existing at the time of negotiations leading up to its execution.

"Government specifications usually contain provisions . . . which are intended to require that all work necessary to complete the job in good order shall be performed, but the bidder has a right to take into consideration the information and data disclosed in the specifications and on the drawings, and to read and reasonably interpret such provisions in the light of other provisions of the contract."

Federal Transportation Tax

We are indebted to a California reader for drawing our attention to the fact that an item appearing in the June issue of this magazine (pg. 96) inadvertently implies that the Federal transportation tax no longer applies to the construction business.

What we intended to report was merely that the United States District Court, Northern District of Georgia, had decided, in the language of the court, that "the payment of an hourly rental for dump trucks used *wholly within the confines of the airfield being leveled*, and as an incident of the grading and leveling of such airfield, was not a payment for the transportation of property within the meaning of the act imposing a tax on *transportation from one point to another in the United States.*"

Our statement that the court decided that the act, and regulations issued under it, "evinced intent that the tax should not apply to such haulage of earth *as was involved in this case,*" was accurate but not adequate. (The same deficiency will be found in the official syllabus to the decision—Lyle v. United States, 76 Fed. Supp. 787—and in an annotation under the text of the tax act at 26 U. S. Code Ann., sec. 3475, Supp.)

The gentleman from California draws attention to another decision evidently not yet published in the law reports, rendered January 24, 1949, by the United States District Court for Nevada, in the case of Getchell Mine, Inc., v. United States. There the court ruled, directly contrary to the Federal court of equal rank in Georgia, that a transportation tax was payable on truck rental involving haulage from one point to another on the mining company's property. Our correspondent also points out that even after the Georgia decision was rendered, the Federal Bureau of Internal Revenue announced its determination to "continue to collect transportation taxes on truck rental for earth-moving purposes where such truck rental was on a fully operated basis".

Supplemental research shows that there is a decision of the United States District Court for Arizona against collectibility of transportation tax on trucks hired by contractors. (Williams v. United States, 72 Fed. Supp. 300, March 17, 1947.) In that case, contractors hired dump and tank trucks from an owner under standard rental rates and hired drivers from a union, placing them on the contractors' payrolls. The court concluded: "that the use of the rented trucks was incidental to construction operations of contractor plaintiffs, and [was] not transportation of property within the meaning" of the transportation tax act.

Check's Binding Effect If Sent as Full Payment

THE PROBLEM: *A construction engineer was paid a salary plus bonus. The salary was paid in full but there was a dispute as to the amount of bonus due him. The employing construction company sent a check stating on its face that it was to cover "payment in full, all compensation due". The engineer retained the check for several months, pending negotiations for a larger settlement. The negotiations failing, he cashed the check. Could he recover any additional sum by suit, on the ground that the check did not fully cover the amount of bonus due him?*

THE ANSWER: No. (Platt v. Penetryn System, 85 N. E. 2d 129, decided by the Ohio Court of Appeals, Cleveland.

The engineer claimed that an officer of the company told him, pending the negotiations, that the notation on the check "did not make any difference". The court ruled that this evidence was not sufficient to show that the officer intended to waive the effect of the notation, much less show that he had authority to waive it on behalf of the company. The court also decided that the payee of a check bearing such a notation cannot defeat the binding effect of the notation by notifying the maker that he is placing the amount of the check to the credit of the maker, and does not accept the check as final settlement. High spots of the opinion handed down read as follows:

"Where there is a bona fide dispute over an unliquidated demand and the debtor tenders an amount less than the amount in dispute, upon the express condition that it shall be in full payment of the disputed claim, the creditor has but one alternative. He must accept the amount tendered upon the terms of the condition, unless the condition be waived, or he must reject it entirely; or, if he has received the amount by check in a letter, he must return it.

"Where, in such case, the creditor retains a check . . . and receives the money thereon and notifies the debtor that the amount is placed to his credit, but that he does not intend that the same shall close the matter, to which the debtor makes no reply, such silence . . . does not amount to a withdrawal of the condition which accompanied the . . . [check] nor a waiver of it."

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Clamps—Tie Rods—Couplings
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LESS WEIGHT TO HANDLE
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- Convertible Crane, Shovel, Dragline or Pull Shovel
- Powered by one engine
- One Operator Control—including travel
- Crane Capacity 20 tons (with outriggers)
- Shovel Capacity ¾ or 1 yard
- Travel Speed (maximum) 8.24 M.P.H.

Truck-Mounted
"Paymaster"

- Convertible Crane, Shovel, Dragline or Pull Shovel
- Separate engine for travel
- Requires two operators
- Crane Capacity 20 tons (with outriggers)
- Shovel Capacity ¾ or 1 yard
- Travel Speed (maximum) 31 M.P.H.

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Crane or Clamshell

- Powered by one engine
- One Operator Control, including travel
- Crane Capacity . . . 35 tons (with outriggers)
- Travel Speed (maximum) 5.27 M.P.H.

With these three rubber-mounted units you can now get all the other advantages of LIMA equipment—greater performance, less "down-time", longer life, etc.—*plus* the added benefits of greater mobility, less travel time, and better maneuverability. Rotating assemblies have the same basic features as corresponding crawler machines, with alterations adapting them to truck or wheel mounting. With outriggers supported, they provide extra capacity. They are ideal for operations requiring constant movement around the job, for small scattered jobs, or jobs remotely located.

THE LIMA LINE NOW INCLUDES:

Crawler-Mounted	*Rubber-Mounted*
Shovels, ¾ to 6 yds.	Shovels, ¾ and 1 yd.
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Lima Shovel and Crane Division

LIMA, OHIO

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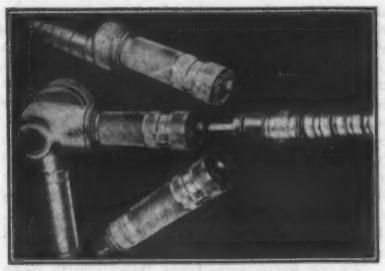


With the Wyco Quick-Change handpiece coupling for flexible-shaft machines, it is no longer necessary to change handpieces by screwing them on and off. Quick snap-on-or-off changes can be made instead.

Handpiece Coupling For Grinder, Sander

A new device has been brought out to increase the efficiency of flexible-shaft machines used for grinding, sanding, wire brushing, polishing, and many other operations. It is the Wyco Quick-Change handpiece coupling, manufactured by Wyzenbeek & Staff, Inc., 825 W. Hubbard St., Chicago 22, Ill.

This device is designed to eliminate the changing of handpieces by screwing them on and off. The company states that with the Quick-Change feature, quick snap-on-or-off changes are made from a straight handpiece to an angle head, or from a grinder to a sander and then to a buffer, with a saving of time and with greater safety for the operator.

The snap-on-or-off feature comprises a sliding sleeve on the handpiece of the straight or angle spindle which locks four steel balls in an annular groove, thereby allowing the handpiece to swivel but not to be unintentionally disconnected. The Quick-Change is offered on all standard Wyco flexible shafts and machines as standard equipment, and the old models may be so modernized at a nominal cost, the company explains.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 71.

Pumps for Construction

Two catalogs on pumps are available from Marlow Pumps, Ridgewood, N. J. Bulletin C-48 is a 10-page illustrated catalog on the Water Wizard self-priming centrifugal pumps and the Mud Hog diaphragm pumps, and their use in the construction field. The line ranges from 1½ to 10-inch sizes, with capacities from 3,000 to 240,000 gpm. This leaflet lists the features, specifications, and capacities of fifteen of the models for various operating conditions.

Bulletin U-47 is a 4-page folder on the Marlow self-priming centrifugal utility pumps. This also lists the features, specifications, and performance records.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 21.

A Measuring Meter

A new type of measuring device is now being made by Shalda Mfg. Co., Burbank, Calif., and sold exclusively through F. D. McGirr & Associates, 145 S. Elm Drive, Beverly Hills, Calif. This device, the Shalda Measure-Meter, is designed to make all types of building and land measurements as it is pushed or pulled along. The company claims for it an accuracy to plus or minus 0.1 per cent in 100 feet.

The device registers up to 10,000 feet in feet and fractions, and will, it is said, add or subtract and measure curves. The telescope handle, detachable for storage, extends to measure high walls, windows, etc. The unit can be run up walls, the company says, to simplify the taking of cubic measurements.

The Shalda Measure-Meter is designed to take all types of building and land measurements as it is pushed or pulled.

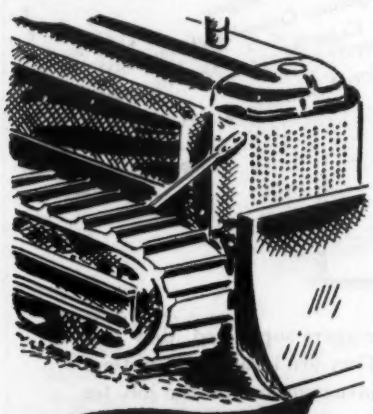
Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 32.

Dinner Meeting on Safety Held for Contractor's Men

Methods and procedures for the prevention of accidents in the construction industry were outlined recently in a talk by John A. Geary, Director of the Education Division of the Engineering Department of the Employers Liability Insurance Corp., of Boston, Mass. The talk was given to 25 key field employees of the Wigton-Abbott Corp., engineers and contractors, of Plainfield, N. J., at a safety meeting and dinner.

William C. Moran, Superintendent of the New Jersey Claim Department of the insurance firm, discussed the necessity of prompt reporting of all accidents. Motion pictures on safety precautions for construction were also shown to the group.

This meeting was one of a series on safety sponsored by Wigton-Abbott for its field personnel in cities throughout the country. The next one is scheduled to be held later this year in Pittsburgh, Pa.



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AVOID HIGH DEPRECIATION CHARGES

You don't have to tie up heavy capital in machines with high depreciation when you do breaking, drilling, driving or tamping. Specify the Barco Gasoline Hammer, industry's rough, tough, economical workhorse. Barco speeds up work schedules, handles intermittent or scattered jobs, avoids heavy transportation costs or carrying charges on idle equipment. Barco works in difficult or hard-to-reach spots, packs a strong wallop anywhere and anytime. Let Barco save you money. Write Barco Manufacturing Co., 1818 Winnemac Avenue, Chicago 40, Illinois. In Canada: The Holden Co., Ltd., Montreal, Can.

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PORTABLE GASOLINE HAMMERS
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TAMPING

Utility Air Clutches Made in Two Styles

Two different types of air clutches are made by the Wichita Falls Foundry & Machine Co. of Wichita Falls, Texas. One is a completely automatic air-compressor clutch; the other employs an air tube for engaging the plates of single, double, and in some cases triple-plate clutches.

The air-compressor clutch requires no attention from the operator, says the manufacturer; it starts the compressor at the desired minimum pressure and stops it at the desired maximum pressure. This clutch is manufactured for 5 and 10-hp air compressors. Designed for heavy-duty use, it has six springs to provide a positive engagement at all times. When pressure operates on the unloader, air pressure acts on a diaphragm to disengage the clutch. The clutch can be mounted at the outer end of the power-unit output shaft and driven by a V-belt pulley on the output shaft. Its friction lining can wear ¼ inch before replacement is necessary, according to the manufacturer.

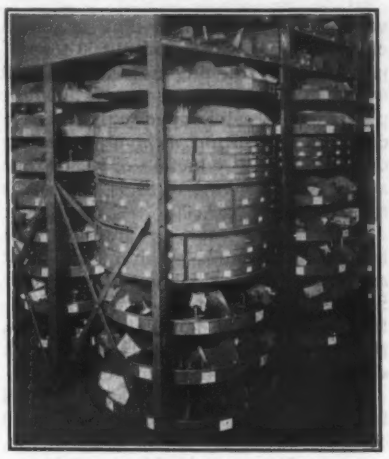
The new air-tube disk friction clutch features direct axial pressure application by compressed air in a flat, circular rubber-and-fabric air tube. It has great torque capacity for a given diameter and length, the company explains, and is unaffected by centrifugal force. It contains no packing, diaphragms, or gaskets. It is insulated from heat generated at the friction surfaces and has air-cooling passages to help keep it cool. It is available in 14, 18, 21, 24, 30, 36, 42, and 48-inch sizes in single, double, and in some cases triple-disk clutches.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 87.

Storage Bins Are Circular, Rotating

All standard models of the circular, rotating-shelf storage units called Rotabins are again available from The Frick-Gallager Mfg. Co., 400 Shubert Bldg., Philadelphia 2, Pa. The company states that the units materially reduce the time required for both storing and servicing parts and tools; also, that savings in space of up to 50 per cent result in shorter trips by tool-crib personnel.

Every tray rotates on ball-thrust bearings. It is claimed that the trays



Rotabins, circular rotating-shelf storage bins, are designed to reduce storage costs and to speed the handling of parts and tools.

will not sag or break when fully or unequally loaded. The bins stand on solid, heavy steel bases.

Further information may be secured from the company by requesting a copy of Catalog No. 106-A, or by using the Request Card at page 16. Circle No. 51.

Bransome Now Chairman And President of Mack

Mack Trucks, Inc., announces that L. G. Bissell and C. T. Ruhf have relinquished their respective positions as Chairman of the Board and President, and that the board has elected to both offices E. D. Bransome. For the last five years Mr. Bransome has been a Director of the company, and since 1935 has been President of Vanadium Corp. of America.

Mr. Bransome will continue his association with the Vanadium Corp. as Chairman of the Board and member of the executive committee. Messrs. Bissell and Ruhf will continue as members of the Mack board, with Mr. Ruhf remaining with the company in a consulting capacity.

Manganese-Nickel Steels

Two catalogs and the latest issues of "The Manganal Marketer" are available from the Stulz-Sickles Co., 134 Lafayette St., Newark, N. J. The company manufactures Manganal, an 11 to 13½ per cent manganese-nickel steel used for the maintenance, repair, and fabrication of equipment subject to severe impact and abrasion.

The first of the folders is about Manganal hot-rolled plates. It gives information concerning their chemical composition, physical properties, applications, stock sizes, and their ability to be flame-cut, welded, formed, sheared, punched, drilled, or machined. It suggests that this material is suitable for quarry and mine skips, gravel and crushed-stone chutes, shovel and dragline buckets, and other heavy-construction applications.

The second folder is a catalog and price list of the company's Manganal, Seaco, and Molmang welding electrodes; its applicator (filler) bars; repointer wedge bars; and tractor grouser bars. Full specifications are given for each of these products, with photographs and drawings of some of the applications.

Each issue of "The Manganal Marketer" deals with a job application of one of the company's products. No. 4, for example, tells how to re-grouse worn tractor treads with Manganal applicator bars, and No. 5 tells how to re-build worn dipper teeth with Manganal hot-rolled wedge bars. These publications are for the use of consumers and potential consumers, and are designed to suggest new product applications.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 36.

FOR EASIER FASTER Drilling

THE McCARTHY VERTICAL DRILL

● For record-breaking performance... for ease of operation, you can't top a McCarthy Vertical Drill. Recently, on one difficult job, workers using McCarthy equipment drilled an 8-inch hole 100 feet deep in only 40 minutes! The derrick is raised and lowered by hydraulic power . . . finger tip controlled . . . and a 60 H. P. gasoline motor is part of the standard equipment.

The McCarthy Vertical Drill, manufactured by The Salem Tool Co., is adaptable to high wall and key way drilling and diamond drill boring . . . drills 90% of all limestone and sand rock formations, and readily burrows through shale. Send today for complete information, and for a free copy of The Salem Tool Company booklet.

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POWER HYDRAULIC CONTROL

Lifts equipment ten times faster than hand pump. Easy installation on new or existing equipment. Hundreds of applications, such as Snow Plows, Sweepers, Power Mowers, etc. Priced for the most conservative budget.

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MONARCH ROAD MACHINERY COMPANY, 327-329 Front Ave., N. W., Grand Rapids 4, Michigan

The "HUSKY"

All-Purpose Road Grader, Maintainer, Ditcher and Terracer

These Huskies are so strong that all parts, except tires, are guaranteed against breakage for one year regardless of why they break.

They will clean out the ditches, cut the sod on the shoulders, resurface and prepare a mile of ordinary Township road per day when pulled with a 40-h.p. wheeled type tractor. Excellent for shoulder maintenance, and are proving most satisfactory on farm irrigation ditching and terracing work.

As a Highway Maintainer they are unexcelled for speed and extra fine work as they eliminate the tendency of road surfaces to washboard. When one-man operated they will cut maintenance costs in half.

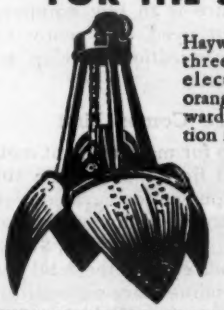
"HUSKIES" cost more and are more than worth it.

Manufactured by

NORTHFIELD IRON COMPANY NORTHFIELD, MINNESOTA

Write Department B.B.

USE RIGHT BUCKET FOR THE JOB



Hayward makes all three—clamshell, electric motor, orange peel. A Hayward recommendation is unbiased.

THE HAYWARD CO., 32-36 Dey St., New York

Hayward Buckets

More Mechanization For Road Maintenance

There's Room for More If We're to Cut Costs in Big Industry Where Half The Labor Is Still by Hand

By H. A. RADZIKOWSKI, Chief, Division of Maintenance, U. S. Bureau of Public Roads, Washington, D. C.

✦ THE upward trend in mechanization of road-maintenance operations is clear from the fact that in 1936, when 145,795 men were employed in the maintenance of 392,418 miles of rural highways under state control, they used 74,481 major equipment units in the performance of their duties. In later years man-power became scarce, the mileage of highways expanded, and highway users' demands for service became more exacting. In the face of the expanded volume of work in 1948, only 79 per cent of the number of men employed 12 years earlier maintained about 550,000 miles of rural highways under state control with 130,010 major equipment units. While many of our roads took a beating from increased use, action of the elements, and obsolescence, nevertheless our maintenance forces with their mechanical aids are to be commended for bringing our roads through without more casualties.

An estimated 329,698 major equipment units were used in 1948 by all state, county, local, city, and village highway organizations in the maintenance of all highways. This equipment has an approximate cost-new valuation of $1,136,837,000. A summary of the state highway department inventory of 130,010 pieces of equipment is given here as an indication of the trend of equipment usage.

Annual Equipment Use

Classification	Number of Units
Automobiles (including station wagons and pick-ups)	12,644
Blades, bulldozer, straight, and angle	427
Compressors, air	1,422
Distributors, bituminous	1,472
Graders, motor	6,041
Graders, tow (including maintainers)	8,081
Heaters, kettle type	6,732
Loaders	2,238
Mixers	2,174
Mowers	6,965
Plants, crushing	499
Plows, snow (displacement type)	17,346
Pumps	1,394
Rollers, power and pull	3,456
Scrapers	841
Shovels, power (cranes, etc.)	1,105
Spreaders	6,875
Sweepers	940
Tractors, crawler and wheel	8,692
Trailers	1,923
Trucks (all types)	29,573
Welding machines	222
Unclassified major equipment	8,948
Total	130,010

While part of this equipment is old or obsolete, the custom has developed in some areas of stretching it along another year to see what happens in equipment development. In such instances, there is a deep-rooted uncertainty as to how to build a modern fleet of power units for today's maintenance programs. Some large-scale equipment operators have a healthy concern that they may be buying fleets for which they must later find work, whereas the sound procedure is to buy equipment for a clear-cut need. Yet many machines after acquisition develop new unforeseen uses.

Surface Comes First

In the search for more efficient methods, we should first appraise the suitability of equipment for surface work. The largest item of highway expenditures is for the surface. In 1948, $1,168,000,000 or 43 per cent of the total construction and maintenance expenditures went for that purpose. Highway maintenance departments are reporting that it is becoming increasingly difficult for maintenance crews to get off the surface and onto other work because of volume of surface repairs needed. With the large volume of old and narrow pavements which will have to await their turn for reconstruction because of limited revenue, maintenance work is further on the increase. For these reasons, the major effort in mechanization development should continue on surface operations.

Shoulder Trenchers

Another pressing problem, in the face of increased volume and speed of passenger vehicles and trucks, is the condition of low and hazardous shoulders adjacent to narrow 18-foot pavements. At least one company has on the market a shoulder-trenching machine which both excavates and loads the material on trucks, or deposits it on the side, depending on the requirements of the job. The shoulder-trenching process is needed in surface widening. Even where the surface is wide there is a tendency to trench and remove unsuitable soils on the shoulders and replace them with granular material where it will help drainage from under the surface.

Our railroad friends have similar ideas in the ballast excavator which they use to remove fouled aggregates from the multiple-track main lines. They have removed and loaded the aggregates with the same equipment combinations into 65-ton gondola cars for disposal or cleaning. The fastest loading time is 12 minutes per car. It is reported as being most helpful where traffic is heavy and interference must be at a minimum. It also sounds like a highway need.

Equipment for Patching

Many large-capacity material-mixing and surface-finishing machines have been developed for high and intermediate-type surfaces. It should be observed, however, that this is a field in which economy can be effected by a careful keeping of unit costs and service behavior records of both the machine and the pavement in place.

As an example, a highway department which kept close records found from an analysis of each of its ten plants varying in type and age that six plants of the old type produced 61,800 tons of paving-plant patching material at $10.19 a ton. In the four newer, more modern plants with greater capacity the average cost was $8.75 a ton, an average saving of $1.44 a ton. Production of 61,800 tons at a possible saving of $1.44 per ton is approximately $89,000.

There is also room for improvement in small bituminous-patch mixers. Most available patching mixers do not fully fill the requirement for a typical maintenance patching job. It would seem that a plant to do this type of work should have the following features:

1. It should have a capacity limited to something in the order of 40 to 60 cubic yards per day to discourage maintenance forces embarking on large-scale resurfacing that might be more adaptable to contract method of operation.
2. The plant should be portable so that it can be set up and start working in a new location in not over one hour.
3. Accurate proportioning devices should be a feature.
4. It should have a transfer pump for bituminous material and a self-contained heating device to maintain the temperature of the bituminous material.

Black-Top Rehabilitation

There is at least one improved type

(Continued on next page)

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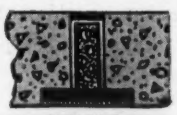

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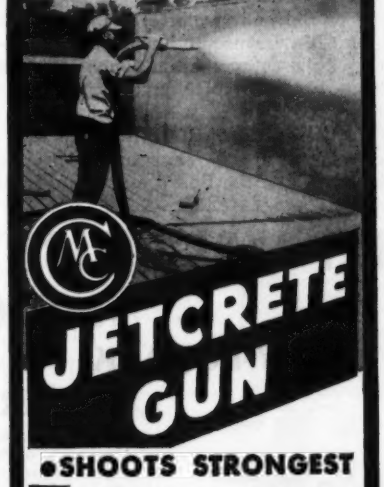

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of machine on the market designed to pulverize old black-top surfaces preparatory to their rehabilitation. It eliminates much of the disking and harrowing which may interfere with traffic. It leaves the torn-up surface without large chunks. No one-way traffic is necessary on the surface being rehabilitated except around the machine. Less equipment is in the way of traffic. It is the modern trend to give the highway user who pays the bill better service even while the road is being rehabilitated.

Motor Graders

There are over 23,000 motor graders in use by state, county, and local highway departments—a 90 per cent increase over 1936. The trends in sizes have not changed too much as between heavy and lightweight graders. Sixty per cent were of the lighter weight in 1936 and 57 per cent were in that category in 1948. Forty per cent of the motor graders in use were heavy in 1936 and 43 per cent in 1948.

There are uncertainties among engineers as to the sizes of motor graders for an equipment fleet. The larger motor graders have been found particularly adaptable for road-mixing bituminous materials and laying oil mats. They have enough power to make the necessary speed and do a fine job of mixing. They give satisfactory performance in blading work since the blade will stay in the position at which it is set. The machines are also adapted to grading sections, but one state maintenance engineer feels that they are very expensive and the rental rate is too high. Another state maintenance engineer expresses his views as follows:

"As perhaps you know, our state maintains the entire road mileage of the state. We have a great many miles of secondary roads of the road-mix type. The heavy machine, a one-man motor grader, has a very distinct place in the reconstruction of roads, cleaning ditches, and work of that nature, but we do find that the lighter one-man grader is a very efficient machine. The low cost of the lighter machine enables us to have twice as many machines. We have found the light-type machine to be suitable on roads where the material is not too heavy; but where heavy work is required, the lighter machine will not produce a smooth road surface."

A western engineer feels "that the question of cost, and the suitability of the lighter machines, makes it imperative that they be used. Larger machines can be kept ready for special jobs to be moved around the state as occasion requires."

But a western engineer from another state differs. He had this to say: "The light machine is O.K. for gravel maintenance, but on bituminous surfacing work our experience was that larger machines were needed. Using the light machines took too much of the operator's time. We get so much more accomplished on our operator's wages that it pays us even though the machine is expensive. The salaries are about the same, but more work is accomplished with the larger machine. Supervisors have been trying to do too much work with the light graders, and they were not economical to use."

The highway maintenance grader and maintainer are an outgrowth of the crude log drags used on our first roads and trails. No one type of equipment exists in as many sizes, shapes, and forms as the grader or maintainer. It can be towed or self-powered, small or large, multi-blade or single-blade, wheeled or drag. The power grader or maintainer, large and small, is a development of the past 20 years and has, through its mobility and operational speed, greatly reduced the unit cost of many blading operations. There are other operations, however, on which the tow grader is still the most effective tool. Many engineers feel that they cannot dispense with the tow grader on some ditch-cleaning operations. There is a definite need for a reduction in the many models and sizes of blading equipment and for standardization of sizes between manufacturers. Such a reduction and standardization would reduce the manufacturing, acquisition, and maintenance costs and would facilitate the selection of equipment for highway maintenance work.

Machines for Low-Cost Roads

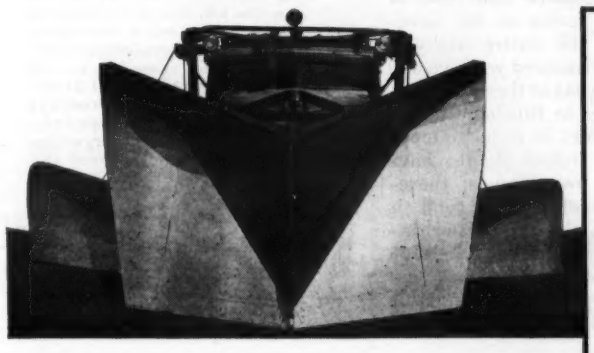
There are available several types of low-cost surface-stabilizing machines. The field of operation is large, and there is room for further development. Out of approximately 2,383,744 miles of county and local rural roads in the nation, 1,322,574 miles are non-surfaced and 1,061,170 miles are surfaced. Of the surfaced mileage 18 per cent are low-cost bituminous or better, and the remaining 82 per cent are gravel, stone, or soil-surfaced. The loss of surface material under traffic and action of the weather is costly to replace and a constant drain on the maintenance budgets. The further development of machines which will help to solve the low-cost road problem without having small local highway departments or contractors tying up too much in equipment investment would be very helpful.

Loaders

Much has, of course, already been accomplished in the development of front-end loaders which has reduced the cost of loading spoil from ditches. The earlier hand methods of performing this operation were reported to have cost a minimum of 70 cents per cubic yard in one state where comparative

(*Continued on next page*)

"Need any neckties, razor blades, bottle openers?"



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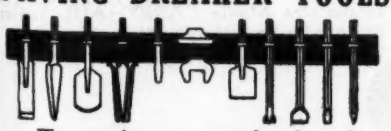

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More Mechanization For Road Maintenance

(*Continued from preceding page*)

tests were conducted. The improved loader performed the same operation under similar conditions for 12 cents per cubic yard. Needless to say there is a very definite upward trend in the use of this type of equipment by state maintenance organizations.

Trucks

The most frequently used piece of equipment in highway work and in road maintenance is the truck. State, county, and local highway departments used approximately 68,800 trucks in 1948 in the maintenance of all rural roads. Using the 1936 inventory of trucks, 1½-ton or over, as a basis, 41.5 per cent more trucks were used in 1940, 51.5 per cent more in 1946, and 65.5 per cent more in 1948.

In traveling around the nation, one is very much impressed by the efficient functional design of trucks used by telephone companies in their maintenance and construction work. Highway equipment cannot be compared on the same level of efficiency to that employed by these companies. Take for instance the standard truck used in most highway organizations for patrol maintenance work. It is usually a conventional-type dump truck designed to be loaded from a gravity tipple or by power equipment. It is very well known that the average patrol or maintenance gang uses its truck to haul bulk materials only about one-fourth of the time or less. The balance of the time it is employed in general utility work hauling men, tools, timber, guardrail supplies, dirt excavated by hand from a ditch—to mention a few uses. It would seem that the type of truck needed by a patrol maintenance gang would have the following features: (1) Low bed height for efficient hand-loading; (2) Power dumping; (3) Possibly a double bottom to allow heating of patching material; (4) If used for snow plowing, the lights should be mounted high enough to clear the plows. Frames and bumpers should be so designed that snow plows can readily be attached and detached; (5) Provision should be made for safety of workmen being carried to and from job, such as removable sides and rear cab windows that will open.

Mowers

The cost of cutting weeds, mowing, etc., is a substantial item. It cost eleven state highway departments $8,000,000 in one year or 8 per cent of the maintenance budget. There were an estimated 10,590 mowing machines used on state, county, and local rural roads in 1948. Mowers could be improved to better suit highway maintenance needs. While new highway designs have gentle slopes and roadside areas which facilitate the use of farm mowers, it is necessary to live for a long while with highways that have more rugged areas to be mowed. More thought should also be given to the comfort and safety of the operator on rugged terrain.

Standard open shoulders and regular reasonably flat backslopes are mowed without trouble, and the pick-up of spoils is not too bad. But the mowing, brushing, and subsequent clearing of steep embankment slopes, generally behind guardrail, and of steep, irregular, frequently obstructed backslopes, call for equipment better adapted to the purpose than we have yet seen.

One state recently reported trying out heavy suction "picker-uppers" for removing cut grass and weeds from the shoulders. This machine was quite effective over such areas as can be reached but required much more flexibility to handle the difficult places. Hand scything is still the way of cutting the rough slopes and the high places in some areas, as well as the embankments behind the guardrails, and it is wholly unsatisfactory.

Brush Cutter

There has been recently developed out west a brush cutter that can cut brush up to 2 inches in diameter with ease, at regular cutting speeds. It is claimed that cuttings up to 3½ inches in diameter can be handled at reduced speeds. While appearance of the mowed area is somewhat less pleasing than that obtained by hand methods, a report covering California Division of Highways activities indicates that this shortcoming is offset by a considerable saving in cost of the work, ranging up to 75 per cent.

In the east, in Florida and Virginia, experiments have been carried on in disposing of brush cuttings by running them through a shredding machine and using the output as a roadside mulch.

Ice, Snow-Removal Equipment

There is a definite need for improvement in sanding equipment for the treatment of ice-coated pavements. As all motorists experience one time or another when ice forms on the pavement, practically the entire highway system becomes galvanized with ice and dangerous to motorists at the same time. Speed is necessary to furnish traction for the highway users. In order to move fast, the sanding trucks should have traction for their own wheels; therefore, a development where sand is spread in front of the sand truck instead of the rear would be most helpful.

Snow-removal equipment has not changed much over the years; it is hoped that there is not too much smugness concerning the need for experimentation with new methods. Snow-removal equipment was put to a very severe test at great odds in the 1947-48 snowstorm in New York City and in the January-February 1949 western snowstorms. Only the heaviest types of rotary plows were able to handle the packed-down snowdrifts which re-

(*Continued on next page*)

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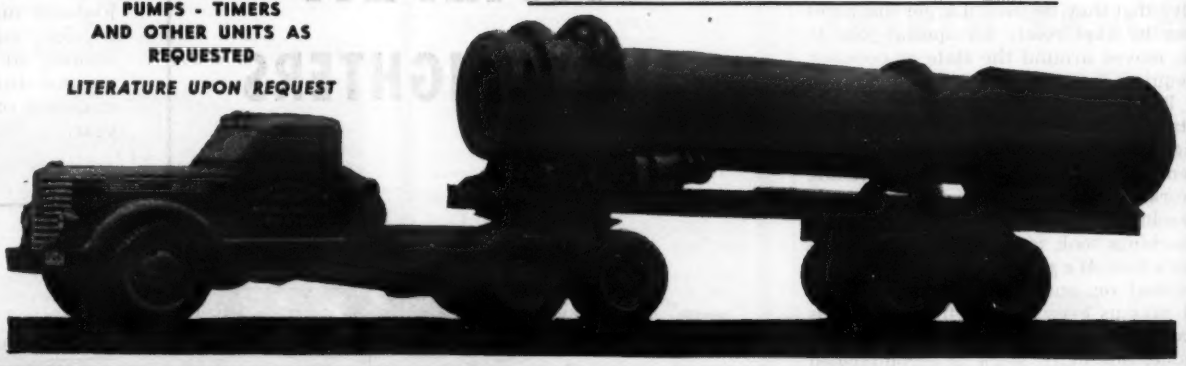

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sulted from the 60 to 70-mph winds and the alternate thawing and freezing weather which caused ice crusts. Bulldozers designed for other work were often effective where snowplows could not penetrate. This is a field in which a double cost exists: the cost of snow removal and the loss of much needed highway-users' revenue if the roads are not adequately and promptly cleared of snow.

A high-ranking highway official with extensive experience and foresight recently asked me the following question: "If the lumber people can be so enterprising as to develop 1,800-pound-pressure hydraulic jets which remove the bark from trees before they are processed in the mills—and if snow-melting equipment is available for mounting on the front of trains—why can't some enterprising equipment manufacturer develop a piece of equipment, utilizing either steam jets or heaters, that will melt the snow without damaging pavements, and send it down the city drains in the form of water?" Now there is food for thought. If experiments can be carried on in the gasification of coal in mines to reduce bulk hauling costs, advancements in the snow-removal field are certainly possible.

The use of radiotelephone in highway operations as a communication medium is making advances. It proved useful in the western snowbound area in dispatching the right type of equipment to the right place at the right time. One state maintenance engineer reported that he had found 20 per cent more snow-removal work could be accomplished with the same equipment through the more efficient use possible by radio control of operations. It was also helpful in informing the public of road conditions so that they would use the highway as little as possible.

Still Many Needs

There are many other needed equipment developments or improvements. There have been times when highway departments could not wait for the cooperative efforts of equipment producers and have developed their own equipment. Center-line marking machines are an example. The State of Washington has even added a loud speaker to its unit to warn the traveling public not to cross the wet paint line. The development of front-end loaders, the California improvements on distributors for joint and crack filling, road magnets for picking up metals which might cause punctures, the Florida traveling bridge shops, sign-crew trucks and elevator ladders for traffic lights—these are just a few of many developments initiated in highway department shops because this equipment was not available when needed.

There is also a definite need for more attention to the metals used in road maintenance equipment. For example, one highway department which orders about 500 tons of cutting blades at a time was advised that by the use of an alloy steel with vanadium, economy is effected by longer life of the blade, though the first cost is higher. A very reputable contractor has also indicated that he is using drill bits of a special metal composition which, while they cost him about 10 times more than ordinary drill bits, give him about 100 times the service.

Even when the equipment tasks are reasonably appraised and the equipment on hand is balanced, there is always the matter of repairs and storage. It is axiomatic that a lack of facilities for these purposes will prevent the equipment from being used to proper advantage, and shorten its useful life. Unless reasonable repair and storage facilities are provided, there can be no such thing as furnishing good machines and operators when, as, and where their services are needed.

Improvements in highway garage layouts and types of tools used in some areas would also be helpful. The following are a few of the items that were noted in one garage inspected: (1) The fact that heavy parts were stored on the second floor involved a back-breaking carrying job. (2) Window sills were high and restricted the full admission of sunlight onto the working floor. (3) The floor was lower than the surrounding terrain with consequent dampness and possible flooding. (4) The door had a 12-foot width and could not clear some of the maintenance equipment with attachments. (5) The welding section was near the office and control desk, etc.

Another problem that needs solution is that of equipment ownership. Some highway departments are small units which cannot afford to buy specialized equipment that would be used for one or two operations and would be idle the remainder of the year. It is a subject worthy of further study.

As stated earlier, highway maintenance is now a $1,000,000,000 industry in which every effort should be made to reduce the heavy annual carrying charge through improved mechanization. There is still 51 per cent of hand labor in maintenance. With the limited available funds and the increased demands for highway services, we must do the work more efficiently at less cost. If we use more money for maintenance, we have less for construction. It has been demonstrated that efficient mechanization is a means of cutting

(*Concluded on next page*)

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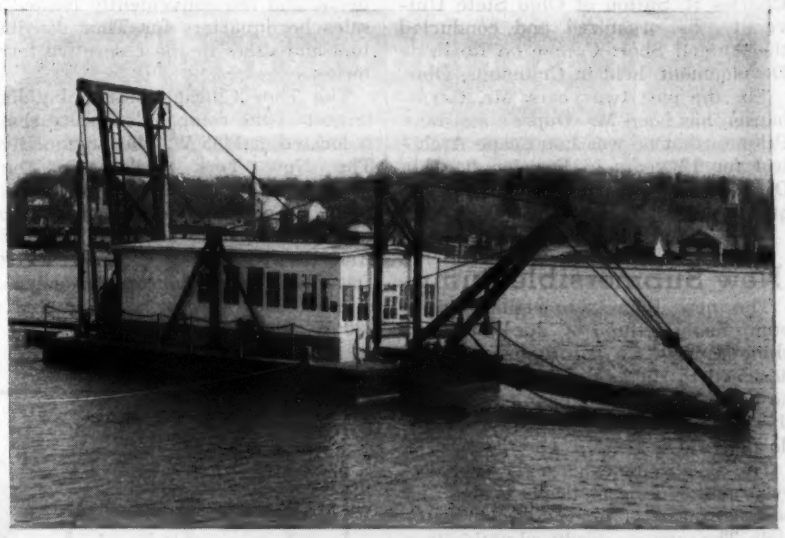

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More Mechanization For Road Maintenance

(*Continued from preceding page*)

maintenance costs.

Before closing I would like to quote a published statement by Rex Whitton, Missouri State Maintenance Engineer, and one of the most experienced and respected engineers in the highway maintenance field. His article in July, 1948, had this to say about highway maintenance equipment:

"Missouri maintenance men think that highway maintenance equipment should be designed for highway maintenance, and should not be some glorified piece of farm or construction equipment that has received a little remodeling in order to make it slightly adaptable for highway maintenance work."

Certainly a highway maintenance industry of $1,000,000,000 size is worthy of attention in devising new equipment tailored for more effective use.

A paper presented at the American Road Builders' Association meeting in Savannah, Ga., May 12, 1949.

Dupre Leaves Ohio Dept.; Succeeded by Garmhausen

Dallas D. Dupre, Jr., Landscape Architect of the Ohio Department of Highways for 16 years, retired from that position on July 15. He is succeeded by W. J. Garmhausen. Mr. Dupre has been very active in national roadside-development affairs. He has represented the American Association of State Highway Officials' Committee on Roadside Development on the Executive Board of the Committee on Roadside Development, Highway Research Board, and also served as Chairman of the latter's Subcommittee on Education. In cooperation with Professor Charles R. Sutton of Ohio State University, he organized and conducted the Annual Short Course on Roadside Development, held in Columbus, Ohio.

For the past two years, Mr. Garmhausen has been Mr. Dupre's assistant. Prior to that he was Landscape Architect for 12 years in Division 9, Ohio Department of Highways, with headquarters in Chillicothe.

New Submersible Pump

The new Enpo submersible utility pump manufactured by the Piqua Machine & Mfg. Co., of Piqua, Ohio, is designed to run under water. There is no possibility, the company explains, of the pump becoming inoperative due to flooding out.

The ¼-hp single-phase 115-volt 60-cycle motor is hermetically sealed and is constructed of non-corrosive materials. The pump is produced with either manual or automatic control. It is of the centrifugal type, with a capacity of 3,000 gph. It is claimed that the pump is non-clogging, has a lifetime lubrication, and is light in weight for portability.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 6.

Decals for Identification

A 16-page color catalog illustrates the features and uses of decals made by Palm, Fechteler & Co., 220 W. 42nd St., New York 18, N.Y. The catalog points out that decals may be used to identify, advertise, and promote products or services. It says that they are easy to apply, permanent, attractive, and inexpensive. Photographs and drawings illustrate the types of decals and the places where they might find use. Also included in a pocket at the back of the catalog are sample decals.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 75.

New Portable Crushing And Screening Plant

A folder on the new Pioneer 17-V portable crushing and screening plant has recently been issued by Pioneer Engineering Works, Inc., 1515 Central Ave., Minneapolis 13, Minn. The new Pioneer duplex plant features the exclusive bottom-deck-feed principle and is designed for small construction jobs, maintenance, and county work. The plant has a 1016 jaw crusher, 2416 roll crusher, and 40 square feet of effective screening surface.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 115.

Four New Factory Branch Sales and Service Bldgs.

New factory branch sales and service buildings in Chicago, New York City, Pittsburgh, and Toronto, Canada, have been constructed recently for Independent Pneumatic Tool Co., Aurora, Ill., manufacturer of Thor portable power tools.

The four new buildings, replacing previous office sites in the same cities, are completely equipped service stations staffed by factory-trained engineers, and are conveniently located as sales headquarters for Thor distributors and users in the respective territories.

The Thor Chicago branch building, largest of the company's 20-city chain, is located at 1405 W. Washington Blvd. The New York building is now located at 32-34 Greenpoint Ave., in the Long Island City section, The Pittsburgh building is at 204 Thomas St. And the Toronto building is at 1909 Davenport Road. The company's export division will continue to be located at 330 W. 42nd St., New York City.

Welding Equipment

The Modern Engineering Co. of St. Louis, Mo., manufacturer of Meco welding equipment, has made available a new catalog, No. 140. Designed as a guide for the welder, it covers every type of equipment necessary for all acetylene and oxygen operations. It contains over 150 illustrations and explains each item of equipment in detail, giving specific recommendations for its use.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 126.

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Pumping Plant Built For Irrigation Work

Excavation and Concrete Tricks Solve Problems For Contractor as Tracy Plant Takes Shape

By RAYMOND P. DAY,
Western Editor

(*Photo on page* 1)

✦ BY PULLING a sensible little ditching trick out of the hat to whip ground water, contractors on the world's second-largest pumping plant have now finished excavation work—making a hole in the ground bigger than Boulder Dam. By an equally clever piece of concrete-form design, forms were used three times in the construction of tricky transitional draft tubes, and the big plant is now completed above the intake level.

The project is the huge $5,888,695 Tracy Pumping Plant near Tracy, Calif., being built by the SUHB Co. of Oakland for the Sacramento regional office of the U. S. Bureau of Reclamation. The SUHB Co. is a joint-venture firm composed of Stolte, Inc.; United Concrete Pipe Corp.; Duncanson-Harrelson Co.; and Ralph A. Bell.

Started August 25, 1947, the pumping plant is scheduled for completion in 960 calendar days. And despite the fact that construction enigmas already have been whipped, there are others lined up for the future. For example, there are three 15-foot-inside-diameter pipe lines, precast, which extend 3,000 feet beyond the plant. Each section will weigh 65 tons. How can they be poured and handled in the field?

SUHB Co.'s contract includes the main intake canal, beginning about 1,000 feet from the river delta; a special culvert to take the water under the Southern Pacific railroad and the Byron-Bethany highway; the main pumping plant; three 15-foot-diameter precast discharge pipe lines 3,000 feet long; and three 15-foot-diameter cast-in-place pipe lines 2,000 feet long. An outlet structure at the start of the 120-mile Delta-Mendota gravity canal completes the work under this contract.

Function of the Pumping Plant

The Tracy Pumping Plant has been referred to as the heart of the Central Valley Project. By taking surplus water which the Shasta Dam makes available in the Sacramento River and pumping it to the 120-mile Delta-Mendota Canal, the pumping plant carries out the essential functions of CVP's initial works: to carry an added supply of water to the water-deficient areas of the San Joaquin Valley.

The new supply goes to San Joaquin's west-side farms to compensate for the San Joaquin River water taken from Friant Reservoir to serve lands in Madera, Fresno, Tulare, and Kern Counties along the east side. This supply will not come too soon, because west-side wells are now beginning to go dry, due to excessive pumping in raising crops.

The pumping plant will lift 4,600 cubic feet per second a height of 200 feet. It will be among the most powerful ever planned by engineers, being exceeded in size only by the Grand Coulee Dam pumping plant on the Columbia Basin Project. The electric motors for the Tracy pumps will require about one-third of the hydroelectric energy generated at Shasta and Keswick power plants on the upper Sacramento River.

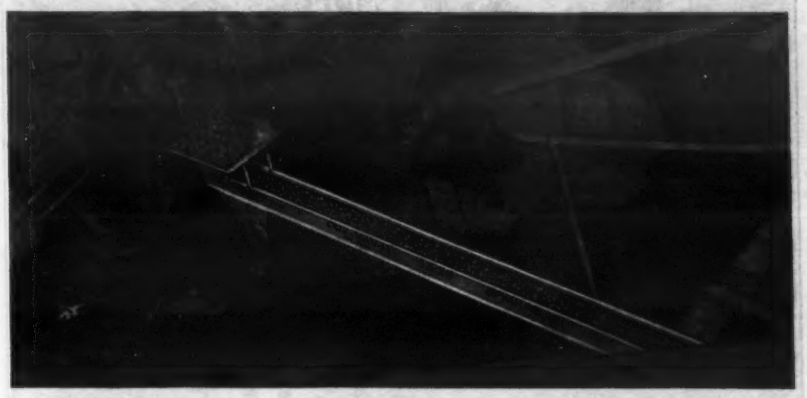
At peak operation, the six huge Tracy pumps will lift into the canal every 30 minutes as much water as the city of Sacramento consumed on its record day in 1947, and Sacramento has the highest per capita consumption of any American city. Every minute the pumps will lift 2,064,600 gallons.

The pumps themselves are under construction by the Worthington Pump & Machinery Corp. of Harrison, N. J. Each is a vertical-shaft centrifugal pump with a capacity of 767 cfs at a pumping head of 197 feet, and a speed of 187 rpm. Each pump is to be connected to an Allis-Chalmers vertical-shaft synchronous motor rated at 22,500 hp.

Huge Excavation Required

The pumping plant is located at an elevation of sea level, and much of the works are below sea level. To make

(*Continued on next page*)



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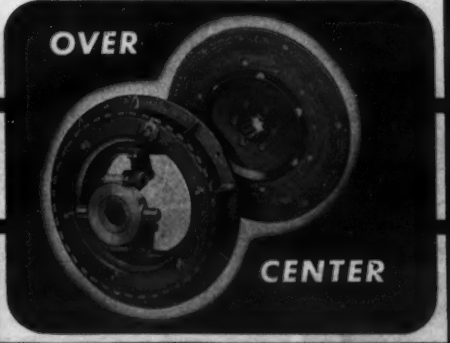

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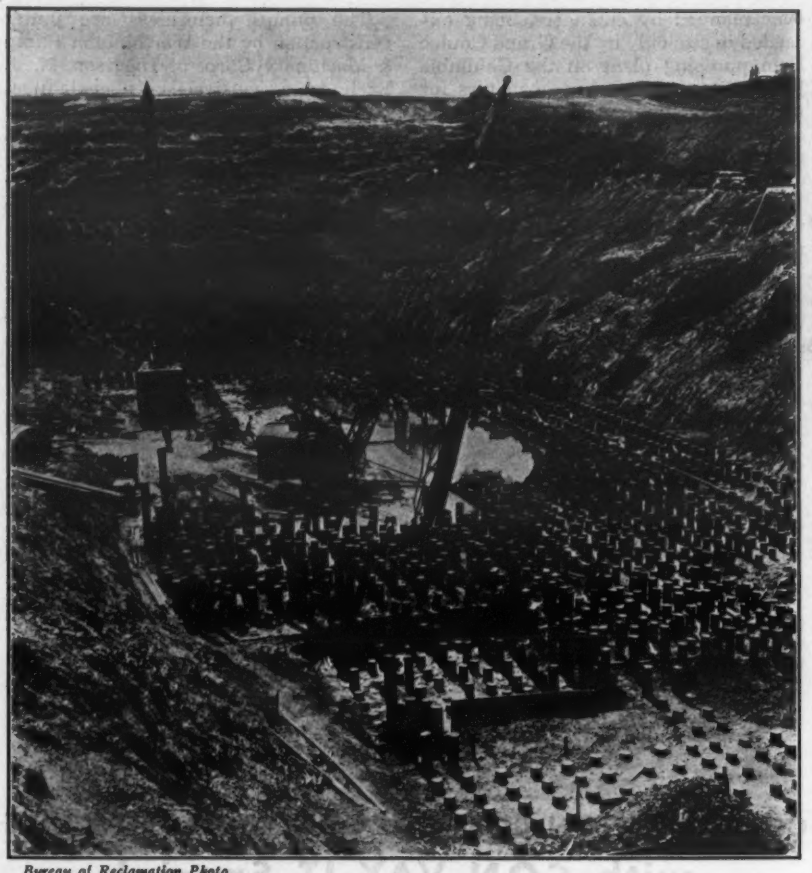

Bureau of Reclamation Photo
In an excavation 85 feet deep, 500 feet long, and 150 feet wide, bottom dimensions, cranes drive timber foundation piles for the world's second-largest pumping plant—the Tracy Pumping Plant near Tracy, Calif. Holes for the 40-foot-long piles had to be pre-bored, so hard was the dense blue formation of sandy clay.

Bureau of Reclamation Photo
This view from the other side of the excavation shows a Colby gantry crane track-mounted at elevation plus 22 to handle forms and buckets for the concrete pours. Behind it is a Noble 750-ton batch plant where two CMC concrete mixers prepare the concrete for pouring. And behind that is the repair shop which the SUHR Co. set up.

Bureau of Reclamation Photo
The same site, many yards of concrete and tons of reinforcing steel later. Notice how the steel trestle now enables the Colby crane to reach all parts of the site with buckets of concrete which it swings down from the plant to the pour. Notice, too, the Pumpcrete lines which send mixed concrete downhill from the batch plant direct to the job.

Bureau of Reclamation Photos

Here are closer views of the Pumpcrete line delivering concrete to a pouring gang (left) and of buggies transporting concrete from a transfer hopper fed by the Pumpcrete line (above).

Pumping Plant Built For Irrigation Work

(Continued from preceding page)

room for the plant building, a hole 500 feet long, 150 feet wide, and 85 feet deep was required, and those are bottom dimensions. A 3 to 1 slope was shaped for 30 feet of elevation, then a berm, then a 2½ to 1 slope for 25 feet, topping out in the final 20 feet with a 2 to 1 slope. Five million cubic yards of excavation were required.

It was perhaps one of the most unusual excavation jobs ever done on an irrigation project, because practically every one of those 5,000,000 cubic yards *had to be hauled uphill.* Every time the elevating loader scooped 12 inches off the top of the borrow pit the elevation differential was really 2 feet, because its hauling units had to climb another foot with the fill. Perhaps even more, if the dirt bulked. The uphill lift got as great as 115 feet when the bottom of the pumping plant was reached.

Worried by water, Project Manager George Waters of the SUHB Co. combed the Bureau of Reclamation investigation studies. He toured the surrounding country and talked to the farmers who had lived there for 40 years. They told him, "There isn't too much ground water in this country. If you work it right you can get to the bottom without wellpoints."

A Euclid 5-BV elevating loader was sent in, pulled by a Caterpillar D8 tractor. Eight bottom-dump Euclids and four Caterpillar DW10's were used to take the dirt away from this high-capacity machine. For about 20 feet down the machines worked fine, but surface water then began to appear and after 5 more feet they had to stop.

Waters then initiated a scheme destined to prove successful. Gambling on the fact that the ground was dense, that there was no general water-bearing formation below, he ordered a drainage trench dug. Two Lima 1201 draglines crawled down to the hole, each equipped with 4-cubic-yard buckets and 65 and 70-foot booms.

One of these machines was used to excavate and cast the intake canal, which was undercut to provide drainage away from the plant. The other Lima rig cut a trench through the pumping-plant excavation, as deep as was economically practical. Usually the ditch was about 20 feet deep. The mate-

(Continued on next page)

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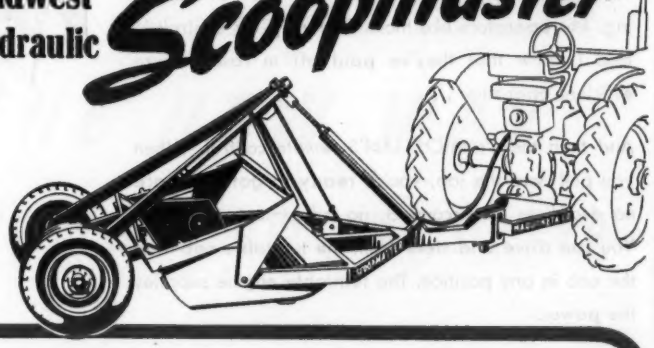

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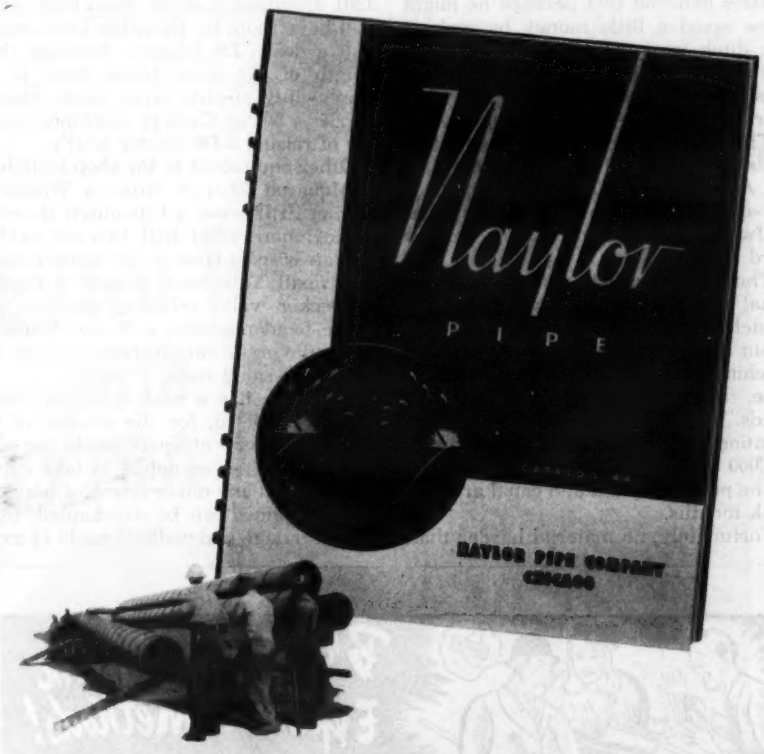

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Pumping Plant Built For Irrigation Work

(*Continued from preceding page*)

rial from the ditch was either loaded direct into Euclids, or cast to one side where tractor equipment could pick it up later.

When this ditch was dug, the surface water immediately dropped down to the bottom, where two electric pumps with float controls could pick it up automatically and dump it away below the site in the undercut intake canal. The top dried up enough to bring in the next fleet of excavation equipment.

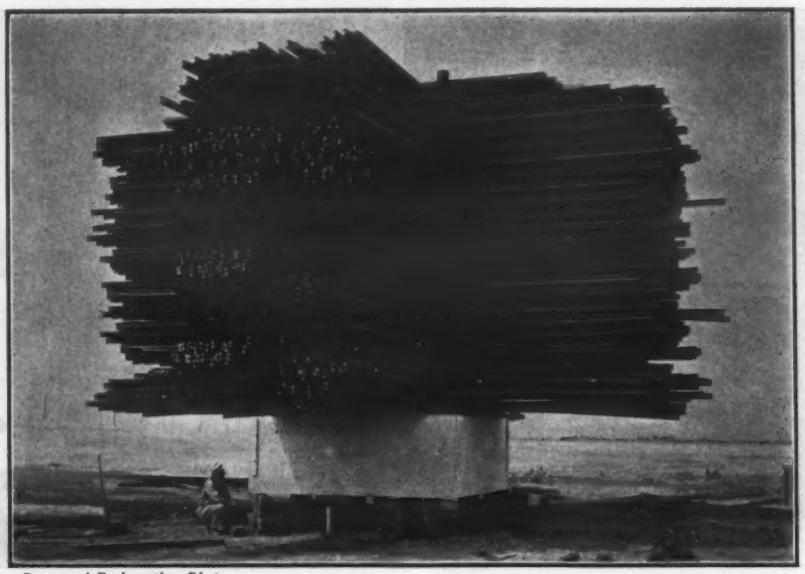
This fleet consisted of 24 Caterpillar D8 tractors, 4 LeTourneau 15-yard Carryalls, and 12 Wooldridge TCH Terra Clippers. These machines were then able to get down to within about 5 feet of the bottom of the ditch before the water again reappeared. The ditch was then re-deepened as before, and the process repeated until the hole was down within about 14 feet of the bottom. This last 12 to 14 feet was removed with the Lima draglines.

Halfway down, a hard, dense blue formation of sandy clay with calcium appeared. Below that layer of hard material were very few if any groundwater springs. Those above the formation were intercepted with pipes and by-passed around the excavation, while the blue material down below sea level remained peculiarly dry. After the excavation job was done, Project Manager Waters believed that perhaps he might have saved a little money by making the ditch work a little less elaborate, but while the work was under way it was a very necessary safeguard to the work just in case—or so it seemed.

The tractor fleet also included two Allis-Chalmers HD-14's and a new HD-19. A Northwest 80-D shovel, with a 2½-cubic-yard dipper, was also used halfway down to load out some of the hard blue muck.

The main excavation for the intake canal was done by a new Manitowoc Model 4500 dragline, with a 120-foot boom and a 5-cubic-yard bucket. This machine excavated and was able to dispose, by casting, of 1,000,000 cubic yards. One of the Limas previously mentioned also helped out. The job saw 440,000 cubic yards of dirt moved out of the pumping plant and canal areas in peak months.

Fortunately, no material harder than the blue "caliche" was found, so blasting was not necessary.



Bureau of Reclamation Photo

The first test piles at the Tracy Pumping Plant stood this 350-ton load test of railroad rails, sinking only 0.16 to 0.19 inch.

To take care of this huge fleet of equipment and to service it properly, one of the most unique heavy-equipment shops in the west was set up. According to Master Mechanic Vern Barker, the big 120 x 250-foot sheet-metal shed had done similar duty before at Boulder and Shasta Dams.

The shop can take one of the Lima 1201 draglines in on its main floor, and still have room for the other Lima, plus half a dozen D8 tractors. Running the length of the main repair floor is a heavy-duty electric crane track which carries a 30-ton Cyclops machine capable of raising a D8 tractor bodily.

Other equipment in the shop includes a Monarch 20-inch lathe, a Walker-Turner drill press, a Cincinnati shaper, a Cincinnati radial drill, two arc welders, an 80-cfm Quincy air compressor, two small Yale hand cranes, a Black & Decker valve-refacing machine, a brake-band machine, a 60-ton Manley hydraulic press, various bench grinders, and other small tools.

The shop has a neat array of bins, properly labeled, for the storage of a large inventory of spare parts for all equipment. It is equipped to take care of just about any minor or major breakdown. Engines can be overhauled, the undercarriage and walking parts of any power shovel rebuilt, and heavy equipment made ready for its next job. In the case of a part not in stock, special work can duplicate it. When the job was visited by CONTRACTORS AND ENGINEERS MONTHLY, several of the big valves in the two Rex Pumpcrete machines on the concrete work had been rebuilt with electric welding, then turned down and dressed in the lathe.

Pile-Driving Work

The dense blue material had good bearing value in its own right, and ordinarily very short piles would have been sufficient. Due to the earthquake hazard, however, a pile penetration of 40 feet was specified for the 3,000 wood piles in the job.

Because it was utterly impossible to drive a wood pile in the hard blue material, the scheme which proved most successful consisted of drilling 39-foot-deep holes slightly less than the diameter of the pile, of placing and driving each pile through this pre-bored hole.

(*Continued on next page*)

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Specifications called for a bearing value of 70,000 pounds per pile. Load tests on piles driven only 12 inches beyond the bottom of the holes showed bearing of 158,000 pounds, more than twice the specified bearing.

The drilling rig was first used on a tractor mounting, but was changed over to a 2½-yard Link-Belt crane.

"We were all concerned about the torque of the drill, hanging from a crane boom," George Waters explained. "In fact, we had talked about using a crane long before we got around to it. Somebody suggested a 3-point spiked tripod below the drill table to counteract this torque. That's what we used. The spikes sank in the ground and stopped all torque action cold. We never had any trouble along that line."

To get away from the drill mud, the 60-hp diesel engine which turned the 4½-inch kelly bar for the rotary drill bit was suspended from a platform on the drill leads. A 2-stage pump produced the 125-pound water pressure needed for fast drilling.

An 8-inch-diameter hole was first drilled 20 feet deep. Then a 10-inch reamer was clamped on, and the hole was drilled to the bottom. This produced a stepped hole 10 inches in diameter in the upper half; 8 inches in the lower half. The rig successfully drilled the same kind of holes for battered piles under the building, chiefly along the expansion-joint lines.

Pile-driving equipment consisted of a Northwest 80-D machine, equipped as a crane. A set of steel hanging leads and a Vulcan 50-C pile hammer were also in the picture. The wooden piles were picked up by a pile line, dropped in the drilled holes until snug, set under the hammer, and driven down an average of 12 inches below the bottom of the drilled holes. Then the pile tops were cut off with saws to exact elevation.

One of Duncanson-Harrelson's pile-driving rigs of the skid type was used for a few shifts, but almost all the driving was done with the Northwest crawler rig. Some good records were established, too—50 stobs to the 10-hour shift was not uncommon. One peak day when a crew "threw a pile-driving fit"—to paraphrase their lingo—they drove 108 piles in 10 hours. Most of the pile driving was done on a 2-shift per day basis, working 10 hours per shift.

Concrete Forms

The exposed concrete surfaces of the Tracy Pumping Plant are formed with plywood and dressed off with a sack-rubbed finish after the forms are stripped. The facings for the substructure surfaces are not given such particular care because they are covered with backfill.

Bureau of Reclamation Photo

Roscoe Granger, Field Engineer for the USBR, watches pile-driving at the Tracy Pumping Plant.

For substructure faces, ordinary shiplap lumber is being used for form facing, nailed to 2 x 6 timber studding. Steel form bolts pass through wales to secure the forms in place during a pour. It is especially noteworthy that form panels are being prefabricated in the job carpenter yard in big sections, sometimes 25 feet high. A Colby gantry crane with a 120-foot boom, track-mounted at elevation plus 22, can reach all parts of the building. It is used to handle forms. Sometimes when the forms have to be stored temporarily, this big rig sets them down gently against piling softeners laid down against one of the excavation slopes.

The trickiest piece of concrete forming which many a man on the job has ever seen showed up early. The feature in question was the draft-tube intakes, where water from the intake canal will roar through to enter the pumps. These draft tubes start off by being rectangular, and they end in an ellipse. They have almost every kind of curve in between that a man can think of.

Because of interconnecting pier noses and the layout of the job, the best way to construct the draft tubes seemed to be to make the layout in three pours. Thus three sections were identical. But how could they strip the forms after they made the pours? The big pours were certain to wedge the forms in very tight.

"We talked about it for weeks before it actually came up," Waters said. "That's the way we tackle practically everything that's unorthodox or tough. Fred Weiss, our Designing Engineer, is one of the sharpest men at this game I have ever seen in 23 years of construction. Charlie Champion, our General Superintendent of Structures, had a big hand in it. We three got our heads together and talked about it for weeks.

"The thing eventually was left in Fred Weiss' lap. He came up with a set of drawings in which the panels for each pour were to be formed in three pieces, beveled so the top section could be stripped with the help of a chain-fall pull from she-bolts in the floor.

"As a safeguard, the 4 x 4 uprights between the base and the top were also cut on a bevel and scabbed with two-headed nails. That way we had a five-way scheme of stripping if we needed it."

The forms were prefabricated, the panels all assembled, and the uprights and the bracing installed. The Colby crane lifted them in place. The first pour was made, and all hands stood by watching with interest to see whether they could be stripped without tearing the lumber apart piece by piece.

The bracing was removed, and a block and tackle was hooked from the base to the top third of the form. The line tightened, and the panel pulled down less than ⅛ inch before it dropped loose, free. The scheme was successful. The other two pieces were then easy to get out, and the forms were used three times with nothing more elaborate than routine patchwork and a little sanding. The draft tubes, incidentally, are plywood-faced.

Concrete Pouring

A Noble 750-ton batching plant with

(*Continued on next page*)

15,000 V.P.M. in CONCRETE

Flexible shaft speed of only 3,600 r.p.m.

At no extra cost the following Plus-Values!

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Pumping Plant Built For Irrigation Work

(*Continued from preceding page*)

two 2-yard CMC concrete mixers is being used to prepare the concrete batches for pouring. Ingenuity appeared again in the set-up of this plant, because the aggregate and sand supply bunkers were dug into the spoil bank in such a way that bottom-dump hauling trucks could dump their loads directly over a 60-foot-long tunnel, connected by 14 bottom gates to a 140-foot conveyor belt line leading up to the Noble plant compartments. No charging clam was needed. The bin compartments automatically flashed signal lights in the tunnel when they were nearly empty, and the tunnel attendant filled them again on demand. With only a batch-plant operator, one oiler, and a tunnel man, the plant turned out 100 cubic yards of concrete an hour many days.

Aggregates and sand for the concrete mix come in from the Tracy plant of Pacific Coast Aggregates. They are hauled in 20-ton bottom-dump wagons under a trucking subcontract by Stevens Brothers Trucking Co. Calaveras bulk cement for the mix comes in from the San Andreas plant of Calaveras Cement Co. and is delivered by its bulk carriers. There is 600 barrels of cement storage space in the Noble plant.

Vinsol NBX air-entraining agent is being used in cut-back form at the plant for each batch.

For a great deal of the work, the mixed concrete is being sent to the job direct by two Rex Model 200 double Pumpcrete machines mounted below the mixers at the batch plant. Using 8-inch delivery lines, these machines will each handle 60 cubic yards an hour. The lines are laid either direct to the pour, or to Gar-Bro transfer hoppers where the concrete can be buggied to the pours.

Pumpcrete technicians frowned on the scheme of pumping downhill to the point of placement. Concrete, it seems, actually pumps better uphill than down, due to the tendency for the mud to separate and form air locks on a sharp downhill slope. But it was handled here with no extra effort, other than keeping the mix rather stiff and keeping the receiving hopper full of concrete. The Pumpcrete machines were 100 feet above their first pour.

Left to right are: George C. Loorz, Stolte, Inc.; Robert Ukropina, President, United Concrete Pipe Co.; Michael Straus, Director, U. S. Bureau of Reclamation; George Waters, Project Manager and O. G. Boden, Construction Engineer, U.S.B.R.

For some of the work, the CMC mixers at the plant discharge concrete to 4-cubic-yard Gar-Bro transfer buckets. The Colby gantry-mounted crane then swings them down to the pour, where the concrete is dumped. Generally this scheme was used in some of the massive pours in the building foundation.

For the pouring of structures, the mixers discharge concrete to a fleet of seven Rex truck-mixers, which are simply used as agitators to the point of pour. One structure poured in this manner was quite interesting. It was a special culvert to take the intake water under the Southern Pacific railroad and the Byron-Bethany highway. To make room for this work, a shoofly had to be built for the railroad track. The highway had to be detoured. The main telegraph lines of Western Union had to be moved, as well as the Southern Pacific signal lines, Pacific Telephone & Telegraph lines, and three oil pipe lines of Tidewater Associated, Standard Oil, and Pacific Gas & Electric Co.

(*Concluded on next page*)

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In all cases the concrete was placed in the forms in lifts usually not over a foot thick, and the concrete was remixed to some extent and consolidated by Viber electric vibrators.

One of the very interesting aspects of the concrete work was scheduled to come up this summer, when the three 15-foot-diameter discharge lines were to be formed and poured. Exactly how this was to be handled still had not been settled upon, but details of this pipe work will appear later on in CONTRACTORS AND ENGINEERS MONTHLY.

"We're all in the 'talking' stage about these pipes at this time," laughed Project Manager Waters. "Somebody will come up with the right answer before long, and it's likely to be experts from United Concrete Pipe Corp. The job is right down their alley."

Principal subcontractors to whom some parts of the big project were sublet include Rutherford & Skoubye, steel reinforcement; Del Monte Electric Co., electrical work; Bigge-Drage, millwright work; and the Koppers Co., waterproofing and membrane work.

Personnel

Officials of the U. S. Bureau of Reclamation in general charge of the job include Richard L. Boke, Regional Director; Carl H. Kadie, Jr., District Manager; O. G. Boden, Construction Engineer; B. P. Bellport, his assistant; George C. Imrie, Resident Engineer; and J. R. Granger, Engineer in charge of field work.

For the SUHB Co., in addition to Project Manager George Waters, Charlie Champion was General Superintendent of Structures, Bill Matthews was Excavation Superintendent, Vern Barker was Master Mechanic, Warren Mooers was Project Engineer, and Bill Giddings was the Chief Designer.

Powered Hand Saws

Two Metalmaster electric-powered wood saws are available from the Bradford Machine Tool Co., 657 Evans St., Cincinnati 4, Ohio: the Model 160, a 6-inch saw with a maximum cut of 2 inches, and the Model 180, an 8-inch saw with a maximum cut of 2-29/32 inches. Standard voltage for both units is 110 volts ac-dc, 60 cycle or less; they are also available in models of 220 voltage.

A strong, light one-piece aluminum housing completely encloses the saw and forms the upper blade guard. The lower telescoping safety guard covers the blade except when cutting. The shoe plates are made of polished steel to resist scoring. The 6-inch cuts to a maximum depth of 1¼ inches at 45 degrees and the 8-inch to a maximum depth of 1¾ inches at 45 degrees.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 12.

New "Route Surveying"

John Wiley & Sons, Inc., 440 Fourth Ave., New York 16, N. Y., announces publication of the third edition of "Route Surveying" by G. W. Pickels and C. C. Wiley. For the most part the general character and make-up of the book remain the same. The largest single revision is in the chapter on stringlining, which has been completely rewritten.

In the new edition latest data on freight-train resistance are given in graphic form. The chapter on spirals has been revised to emphasize approaching the spiral from the viewpoint of speed and curvature rather than length and radius of curvature. A number of important changes have been made in the tables; all logarithmic tables have been omitted and the tables of natural trigonometric functions increased to seven places.

The book can be secured from the publisher. It costs $4.75.

Truck Crane Travels The Roads to Owner

One of the first truck cranes to be produced in the P&H's new, specially designed truck-crane plant in Escanaba, Mich., was recently driven to the owner's city. The truck crane, manufactured by the Harnischfeger Corp., 4400 W. National Ave., Milwaukee 14, Wis., was purchased by the Road Material & Equipment Co. of Jackson, Miss. Following the regular highway routes, it made the trip from Milwaukee to Jackson in four days.

The truck crane, a 12-ton-capacity Model 150, is equipped with a 25-foot basic boom and carries two extra boom inserts, one of 10 feet and one of 5 feet. The machine also has P&H remote control, which enables the operator to control all truck functions by electric push-button, from the crane cab. The model is dual-powered with separate engines for travel and for crane power.

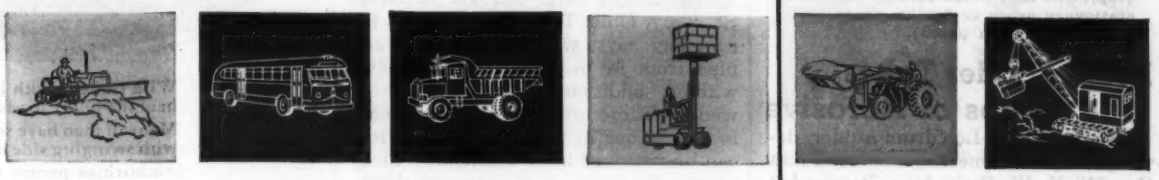
This P&H Model 150 truck crane was driven from Milwaukee to its purchaser in Jackson, Miss.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 34.

Blast-Hole Drilling Tools

A special condensed price-list catalog on Cyclone blast-hole drilling tools is available from the Sanderson-Cyclone Drill Co., Orrville, Ohio. It is intended as a handy pocket reference but not to supplant Catalog T which may also be obtained for the complete tool list. A special pocket notebook on specific tools is also available.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 106.



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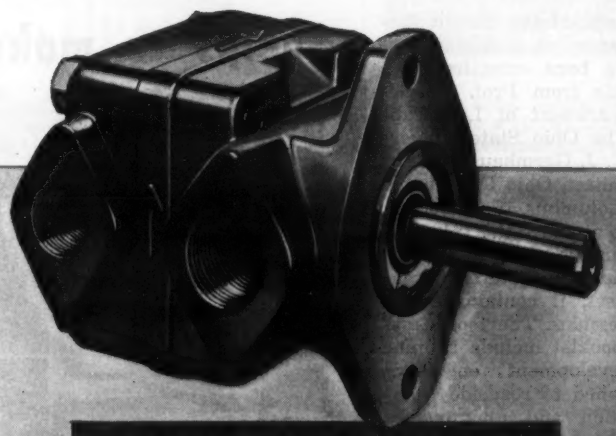

THE ONLY PUMP THAT AUTOMATICALLY MAINTAINS CORRECT RADIAL AND LATERAL CLEARANCES AT ALL TIMES

The rigorous job requirements of construction, agricultural, automotive and materials handling machinery have long pointed out the need for a hydraulic pump expressly designed for this service. The new Vickers V-200 Balanced Vane Pump has been designed and developed to meet these requirements with the usual Vickers high quality workmanship . . . all adding up to the "Best Pump Value" for this industry.

Longer life at maximum efficiency, far in excess of fixed clearance pumps, is assured as the Vickers Pump is the only pump designed to maintain both radial and lateral running clearances at all times. Not only is normal wear perfectly compensated, the pump even automatically adjusts its clearances to oil viscosity variations resulting from temperature change. As a result, correct clearances are maintained and more oil is delivered for useful work.

For many installations the nominal rated capacity of the pump is adequate, making it unnecessary to select the next larger size to provide additional capacity to compensate for loss due to high operating pressures, increased temperatures or normal wear. Thus, in many cases, a smaller pump can be used resulting in a more compact, efficient, and economical installation.

The tried and proven Vickers feature of "hydraulic balance" eliminates bearing loads resulting from pressure. The vane principle provides for no-load starting . . . important in cold weather cranking. Greater mounting adaptability is another advantage.

For better service, much longer life, with maximum efficiency all the way . . . you need Vickers V-200 Pump on your mobile equipment. Write for Bulletin 49-52.

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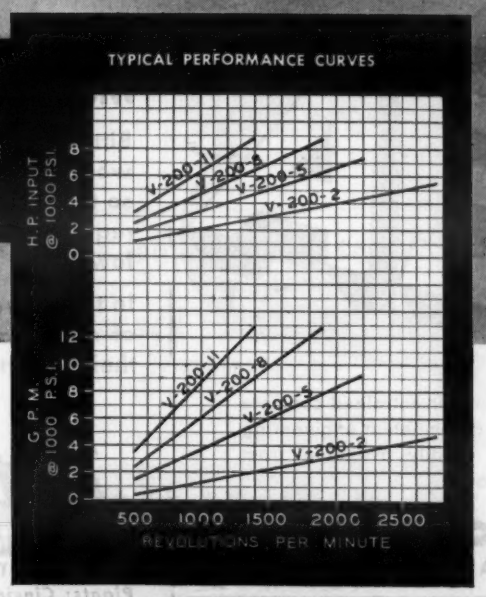

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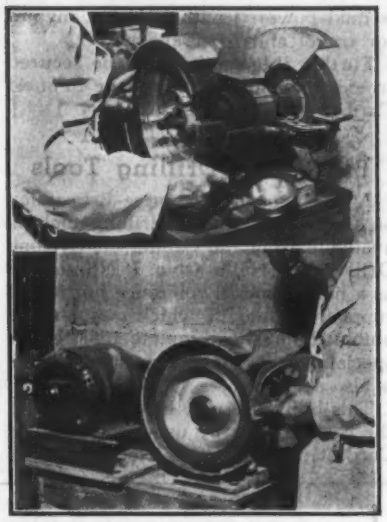

Abrasives in roll form can be wrapped around the Cone-Loc drum sander (top). The unit works equally well on a stationary arbor or flexible shaft (bottom photo).

Drum Sander Takes Strips of Abrasive

The new Cone-Loc drum sander, developed by the American Diamond Saw Co., 519 N. W. Park Ave., Portland 9, Oreg., is a balanced aluminum split drum cushioned with rubber; the halves of the drum are locked into a solid drum by a cone-type washer. The sander's light weight makes it adaptable for use with a flexible shaft as well as on a stationary arbor.

Standard-width abrasives, available in roll form, are wrapped around the drum and secured into place by pins that recede out of the way when the cone washer is tightened down. During buffing, polishing, or grinding operations the wheel will not lose its diameter nor need dressing.

Abrasive cloth in various grits can be interchanged on the same drum to accommodate rough or fine work. The new Cone-Loc drum sander is available in 6¼ to 12-inch diameters and in various standard widths and bores.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 17.

Units for Black-Top Roads

A new catalog on four of the Littleford units for black-top road construction has been issued by Littleford Bros., Inc., 457 E. Pearl St., Cincinnati, Ohio.

It describes, first of all, four models of the Spray Master pressure distributors. Both the front and rear-engine models are available with low-pressure or torch-type burners. The Spray Master may be had in truck-mounted semi-trailers or in the new frameless construction models, and in sizes from 600 to 4,000 gallons.

The catalog also features two models of the company's supply tanks: Model No. 102, with two vaporizing torch-type burners; and Model No. 103, with two atomizing low-pressure burners. Both have two U-type heat flues for heating materials. These units are also available in either the frameless or the semi-trailer styles.

The other two products mentioned in the catalog are road brooms, traction or power-driven; and the Tankar heater, a steam-producing outfit.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 134.

Pipe Pusher, Puller

A new and larger pipe puller and pusher has been added to the line made by the Trojan Mfg. Co., 441 E. Water St., Troy, Ohio. This new Model B, the company says, will push or pull any pipe from ¾ to 2 inches in diameter without additional dogs, clamps, or wedges. There are three pushing speeds for variations in types of soil. The tool can be reversed in 30 seconds by turning the dogs over in the opposite direction, it is reported.

The Model B pusher is double-action and continuous in operation. The forward motion is continuous without resetting the grip on the pipe, as action on the lever insures that either dog will hold as the other moves back for a new grip. This pusher is of all-steel construction and the frame is welded.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 78.

Roadside Development: The 1949 Short Course

The proceedings of the Eighth Annual Short Course on Roadside Development have been compiled in a booklet available from Prof. Charles R. Sutton, Department of Landscape Architecture, The Ohio State University, or from W. J. Garmhausen, Chief Landscape Architect, Ohio Department of Highways, Columbus 15, Ohio.

For those who attended the 1949 conference in Columbus, the booklet will provide refresher and reference material. For others, it contains a full report of the sessions. The topics discussed in the booklet include training of roadside-development engineers, drainage as applied to roadside problems, construction and maintenance of roadside parks, parking and access, zoning, weed control, and tree care.

Dredging Equipment

Full information on the dredge design and engineering services of the Yuba Mfg. Co., 351 California St., San Francisco, Calif., is available from that company. Although best known for its placer-mining dredges, this firm offers a consulting service by which dredges and dredging equipment can be planned to meet the requirements of any type of job. The Yuba dredges now in use are both large and small, operating all over the world.

To secure information on this dredging service, write direct to the company or use the Request Card at page 16. Circle No. 59.

A 10 FT LOAD ON AN 8 FT. TRAILER?

With trailer width limited to 8 feet in several states how do movers haul the bulky loads in excess of this width?

Many of then have solved the problem with Rogers Trailers equipped with swinging side brackets which quickly widen the trailer to 10 feet.

Authorities permit these necessary moves knowing that the return trip will be made with the trailer again narrowed to legal width.

Solutions to other unusual problems are to be found in Rogers Girder Type and Rocking Beam Trailers.

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FOLLOW-THROUGH helps to make BITUCOTE and ROADS BETTER

The quality of the emulsion is proved in the mixing as well as in the laboratory.

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Safety and simplicity of application—Bitucote Emulsions, mixed with local aggregates, are applied unheated and with ordinary road equipment.

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Bitucote engineers and laboratory chemists are constantly working and consulting with road engineers and contractors so that Bitucote Emulsions may be formulated to the practical requirements for good road building and maintenance at low cost.

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DAREX AEA

For high quality air-entrained concrete—backed by a competent engineering field service readily available from your distributor.

DEWEY AND ALMY CHEMICAL COMPANY

CAMBRIDGE 40, MASS.

New Bridge Is Built To Pensacola Beach

(*Continued from page 3*)

ily and to precise lines.

Bascule Span

In the meantime work was moving ahead on the construction of the piers for the bascule span. The reinforced-concrete piers measure 35 feet 2 inches x 32 feet 8 inches at water level, and each pier is supported on two footings that were built within steel-sheet-pile cofferdams, each 41 feet 3 inches x 16 feet 6 inches. The cofferdams consisted of M-116 sections, 45 feet long. The wale frames were prefabricated and set in position where the three rings were assembled, and used as a guide for driving the sheet piles. After they were driven, the cofferdams were excavated with a clamshell bucket, the two operations working in sequence. In each footing 96 untreated-timber piles, 45 feet long, were driven into the sand. These 384 piles extend through a 10-foot concrete seal 12 inches into the footings, which were poured in the dry. The bottom of the seals is minus 30.0 elevation. The footings extend 4 feet above the top of the seal, or to minus 16.0 elevation. The tops of the piers are at 29.0 elevation.

On the pier forms 1-inch lumber was used, backed with 2 x 6 studs on 18-inch centers, and double 2 x 6 wales. The panels were secured with Richmond Tyscrus. Form work was speeded by the use of a DeWalt circular table saw set up in a carpenter shop on the north bank, power for its operation being supplied from the line current. Out on the job were several portable SkilSaws that ran off two Fairbanks-Morse and Onan 3-kw light plants. The reinforcing steel for the project was supplied by Truscon Steel Co. out of Gadsden, Ala., and was placed by the Atlanta Steel Erectors of Atlanta, Ga.

The bascule span itself was fabricated and erected by the Nashville Bridge Co. Structural steel totaled 375,000 pounds. The 3 x 5-inch open-grid steel floor for the bascule came from The Tennessee Coal & Iron Co. plant at McDonnell, Ohio.

Concrete Trestle Superstructure

As the concrete piles were driven in bents, work on the superstructure followed behind. The piles project 12 inches into the poured-in-place caps which are 28 feet long x 3 feet wide x 2½ feet deep on the typical intermediate bent. Bottom forms for the caps were 2-inch tongue-and-groove stock, while the sides were ¾-inch plywood. The concrete deck consists of four girders, 1 foot 4 inches wide x 2 feet 10 inches deep, supporting a 7¾-inch slab. On both sides are curb walks, 2 feet 6½ inches wide. The bridge is not intended for pedestrian traffic, and the precast concrete rail, only 2 feet high, was kept low so as not to interfere with the view of passing motorists from the roadway. At every 33-foot span there is a premolded cork expansion joint.

The building of the superstructure brought out several ingenious methods on the part of the contractor to expedite the work in the most efficient manner. A concrete-mixing plant was set up on shore at the north end of the bridge. This consisted of a Ransome 34-E single-drum paver from which the boom and bucket were removed. The stripped-down paver was placed on a timber crib with a dirt ramp leading up to it. Batch trucks, holding two batches each, backed up this short ramp to discharge their contents of sand, gravel, and cement into the skip on the paver. The mixed concrete was discharged from the drum down a chute into a Gar-Bro 2-yard concrete floor hopper mounted on a truck. Three such units were used in hauling the concrete.

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MODERN MACHINERY
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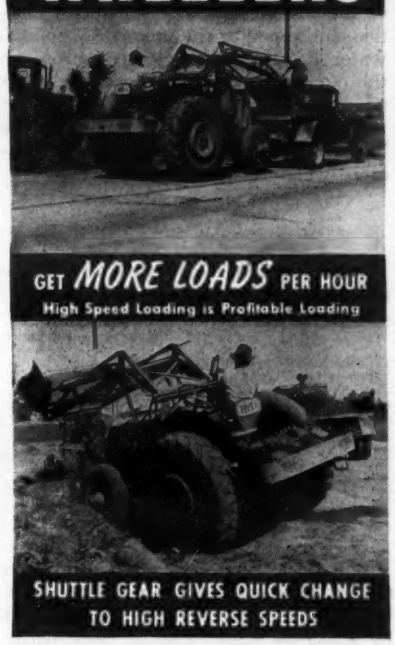
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SHUTTLE GEAR GIVES QUICK CHANGE TO HIGH REVERSE SPEEDS

An exclusive feature you will appreciate on MM Industrial Wheelers is *shuttle gear* performance to streamline loading and dozing operations.

Straight line reverse lever on *shuttle gear* eliminates slow shifting—the shuttle gear also provides 6 forward and 6 reverse speeds up to 14.5 m.p.h. for saving valuable time on every job.

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Front wheels are inset over steering knuckle pins to eliminate road shock and binding under heavy front-end load . . . minimize operator fatigue.

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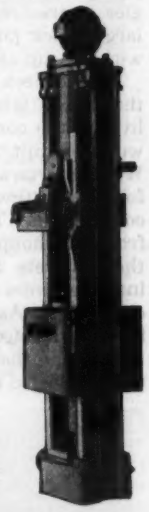
● It takes FORCE when they're stubborn—whether they're mules or piles. And in subduing stubborn piles there's one best answer—Warrington-Vulcan Single-Acting Steam Pile Hammers. The Single-Acting Warrington-Vulcan operates at a medium steam pressure, delivers a moderate frequency of low velocity blows from a relatively heavy ram, puts down wood, concrete or steel piles with speed and savings. Its simplicity of design and rugged strength minimize operating, maintenance and mechanical costs. Its rapid, regular and continuous action has been getting proved results since 1887.



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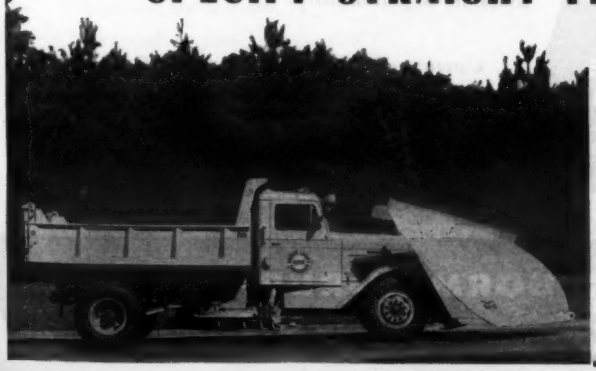

Duplex Straight Frame Construction means much easier, much more dependable plow and scraper mounting!

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TRUCK COMPANY
LANSING 4, MICHIGAN
PROTECTED DEALER FRANCHISES AVAILABLE IN SOME AREAS

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See pages 97, 98 and 99

New Bridge Is Built To Pensacola Beach

(*Continued from preceding page*)

The height of the floor hoppers made necessary the timber cribbing for the paver foundation.

In building most of the bridge, the concrete was placed in the forms after it had been discharged from the floor hoppers that had stopped along the old span. The timber structure was not deemed safe to support a large crawler or truck crane handling concrete buckets; also there was no room for large equipment on the deck since traffic had to be maintained over the bridge. Accordingly two light but strong aluminum bridges were built to span the gap between the old and new structures. Over these were pushed CMC Dumpover carts with a load of concrete from the truck-mounted floor hoppers. As many as eight of these buggies were employed on a pour.

Aluminum Work Bridges

The aluminum work bridges were 26 feet long x 3 feet wide and had a steel-mesh floor grating for moving the buggies. One bridge weighed only 450 pounds, yet was capable of being loaded to 3,000 pounds. They were handled easily, usually by a Sasgen 1,800-pound hand derrick mounted on a flat-bed truck. To eliminate a steep incline from the old to the new bridge, the east ends of the work spans were generally set up on cribbing, elevated from the timber floor of the original bridge. In cap work, as a rule, only one of the aluminum bridges was used, with the second one being transferred to a new location. The runways were continued out over the cap forms so that the buggies were readily dumped. On the larger deck pours, the two work spans were set up side by side.

As the deck work got further along, the trucks with the floor hoppers delivered the concrete, as close as curing would permit, to the deck being poured. Wooden runways ran out over the forms lengthwise of the span under construction. The buggies were filled from the hopper, and they discharged the concrete from the runways first into the girder forms and then over the entire deck. As the concrete was placed, it was vibrated with Mall vibrators.

Some of the high caps were poured with a 1-yard concrete bucket that was handled by a Sasgen 4-ton stiffleg derrick mounted on a wooden barge 80 feet long x 24 feet wide with a 6-foot hull. This rig also handled forms and various other materials used in building the bridge.

Concrete Mixing

Dry batches were purchased from the Noonan Construction Co. in Pensacola, and hauled 6 miles to the mixer set-up at the north end of the bridge. Both Lone Star and Lehigh cements were used. The sand came from pits in Flomaton, Ala., and the gravel was supplied by the Rocquemore Gravel Co. of Montgomery, Ala. The cement was shipped from Birmingham, Ala. A 9-bag batch was used, with 7 bags of cement to a yard of concrete. This mix produced concrete that tested from 4,000 to 5,800 pounds on the 7-day cylinders. Water for the concrete was pumped from a well on the north side of the bridge near the contractor's office, and piped to the mixer. A 2½-inch water line also was carried across on the old bridge to feed the soaker hoses used in curing the concrete.

The dry weights of a typical 9-bag batch that yielded 1.285 yards of concrete were as follows:

Cement	846 lbs.
Sand	1,391 lbs.
Gravel	2,728 lbs.
Water	31.2 gals.

The gradation of the fine and coarse aggregates follows:

Sieve Size	No. 9 Gravel Per Cent Passing	Sand Per Cent Retained
1½-inch	100	....
1-inch	95-100	....
¾-inch	80-100	....
½-inch	35-70	....
⅜-inch	5-30	....
No. 4	0-7	0-5
No. 8	....	0-15
No. 16	....	3-35
No. 30	....	30-75
No. 50	....	65-95
No. 100	....	95-100

Deck Forms

The deck forms were moved from span to span on an 80 x 26-foot wooden barge towed by a 48-foot tug powered by a 225-hp diesel engine. Each barge held a complete set of forms for one span. For the deck and beam sides ¾-inch plywood was used, and 2-inch lumber for the beam bottoms. Supporting one deck form were 8 large I-beams — 18-inch, 54.7-pound. These beams were 30 feet long and were placed longitudinally to the bridge. Beneath these were two pairs of 40-foot-long cradle beams, each consisting of two 18-inch 54.7-pound I-beams, set transversely across the bridge. This steel framework was set up on timber cribbing on the barge, one crib at each of the four corners. With this elevated position the amount of hoisting required to set the span form in place was kept to a minimum.

C. & E. M. Photo
On the Pensacola Beach Bridge job—Dan S. Brock, left, Superintendent for Johnson, Drake & Piper, Inc.; and R. G. Patterson, Manager-Engineer for the Santa Rosa Island Authority

At each corner of the barge was an A-frame. The two on the west side of the barge, when it was in working position, were 29 feet high. The two on the east side were only 21 feet high. Since the barge always approached the new bridge from the west, the old bridge blocking off an eastern approach, the two A-frames on the east side were lower for the purpose of clearance. Once the barge was in position, extensions on the east side A-frames were raised, making their effective height 29 feet, the same as the others. Additional maneuverability with the A-frames was also provided by having them pivot at the base. Guys to the deck held them securely once they were in position for raising the deck form.

The extensions on the A-frames

(*Concluded on next page*)

General
General Wheelbarrow Co., Inc. Wichita, Kansas

Engineered and built to wheel easier and last longer. That's why GENERALS are first choice.

★ Now available at competitive prices.
★ Leakproof, 16-gauge steel trays.

Brick and tile, foundry and industrial steel handle models available. Write for the name of your nearest distributor.

"The Wheelbarrow with Orange Handles"

WHAT DO YOU WANT IN A PUMP?

FAST PRIMING!
This Pump Primes at 25 foot Suction Lift in 61 seconds.

HIGH PRIMING!
Gorman-Rupp featured High Priming in demonstrating pumps at the Road Show.

HANDLE DIRTY WATER!
This Pump will handle whatever muck passes the suction strainer. There is nothing to clog.

DEPENDABILITY!
Always the most simple design -- always the most in dependability.

MADE IN ALL SIZES
7M - 10M - 15M
20M - 30M - 40M
90M - 125M

Gorman-Rupp Pumps meet A.G.C. standards in every respect. Every Pump fully guaranteed.

Write for the new Contractors' Bulletin 8-CP-11.

THE GORMAN-RUPP COMPANY
MANSFIELD, OHIO

along the east side of the barge were elevated by a Beebe 2-ton hoist at each structure. The entire deck form was raised by four Beebe 5-ton hoists, one at each corner A-frame. Once the form was raised very gradually to the proper level, it was secured in place with 1½-inch hanger bolts that tied to hanger beams bolted to the caps. Each cap had eight sets of these hanger beams, which actually were pairs of 6 x 4 x ¾-inch angles above and below the caps, and connected by 1-inch lock bolts. A deck form span was moved from one location and set up in another within a single working day. The collapsed forms were then re-set, and the bulkheads were re-built.

From 3 to 3½ hours were required to pour one of these deck and girder spans. For screeding the concrete, the contractor built a screed entirely of aluminum with the exception of a 5-inch steel channel for the bottom contact member. This screed weighed only 450 pounds as compared to the average 1,000-pound weight of the typical steel screed in common use. The tool is 35 feet long and comes apart at the center for ease in shipping, and also in case an extension is needed should it be used later on spans of greater length.

Timber Connecting Bridge

Early in May the northerly half of the trestle and the bascule span were completed. A timber connecting ramp was then built just south of the bascule, permitting traffic to cross the Sound on the northerly half of the new bridge and the southerly half of the old bridge via the timber connection. Once this ramp joining the two bridges was in operation, the old draw span was no longer opened for navigation; waterway traffic used the new channel under the bascule span. The northerly half of the old bridge was dismantled, of course, at the same time so as not to interfere with the passage of boats. The pile bents that were left out opposite the old draw were then driven, and the remainder of the deck on the south side of the new bridge was completed.

The remainder of the old bridge was then removed with the exception of a 620-foot section at the south end or beach side. This will provide ample space for fishermen who might otherwise be tempted to fish from the new bridge. The location now provided, moreover, is the best possible fishing spot in the area since it is built over the former dumping grounds of ships that came in with ballast to the harbor from Europe. The rock unloaded from these vessels has, over the years, developed into a natural feeding site for fish.

Material for the approaches, amounting to some 82,000 cubic yards, was taken from the Sound by an 8-inch dredge. The hydraulic fill, together with the grading and bituminous paving of the approaches, was done by the Ray Construction Co. of Pensacola. The fender piles, the timber foundation piles for the two bascule piers, and the detour cross-over ramp was handled by F. Rust Smith & Son, Inc., of Pensacola. Including the personnel of the subcontractors, up to 160 men were employed on the construction of the new bridge.

Revenue From Tolls

Like the original timber bridge, the new structure is a toll span, with a 25-cent round-trip fee for passenger cars. Besides building the first bridge, Johnson, Drake & Piper, Inc., also erected a $350,000 casino on the beach. Six years ago both the bridge and casino passed from the hands of the builder who had been operating the facilities, and, one year ago, were taken over by the Santa Rosa Island Authority. The new bridge is only the initial project in the development of the island by the Authority.

The major items in the bridge contract included the following:

Concrete	11,400 cu. yds.
Reinforced steel	1,950,000 lbs.
Hydraulic fill	82,000 cu. yds.
Concrete piles	27,000 lin. ft.
Structural steel (bascule)	370,000 lbs.
Timber piles	24,000 lin. ft.

Dan S. Brock was Superintendent for Johnson, Drake & Piper, Inc. R. G. Patterson is Manager-Engineer for the Santa Rosa Island Authority.

Catalog on an Impactor

A folder describing the Model C-25 240-pound impactor is available from Wayer Impactor, Inc., 330 Rowlands Bldg., Columbus 15, Ohio. The bulletin gives the specifications and lists the features and uses of this impactor. A report which compares the compaction achieved by a 240-pound Wayer impactor with that achieved by a 10-ton roller is also included.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 107.

New Cavity-Wall Tie

Rock-Fast cavity-wall ties are now available from the Rockford Fastener Co., P. O. Box 353, Rockford, Ill. They are designed to tie and space cavity walls, and they have a moisture-drip feature which the company says will protect them against the corrosive action of moisture, lime, and mortar.

These ties are available in high-strength No. 5 size .207 lime-drawn-steel zinc-clad wire, steel-alloy copper-clad size .204, and stainless-steel size .207 wire. Two sizes are manufactured: the No. 623 has a 6-inch stem, 2-inch spacer, and a 3-inch wing; the No. 843 has an 8-inch stem, a 4-inch spacer, and a 3-inch wing.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 35.

RAINCAP

STOPS MOISTURE FROM FALLING INTO TRACTOR EXHAUST . . . Just slip the "RAINCAP" over the open end of your tractor exhaust, and you eliminate forever the danger of moisture falling into the exhaust, injuring your tractor

THE CAP THAT DOES NOT FORGET TO CLOSE . . . Completely automatic—the "RAINCAP" is counter-balanced to open when the tractor starts and close when it stops. Rust proof—made of cast aluminum with bronze bushing—can be installed in two minutes F.O.B. Waterloo, Iowa.

Write Dept. C-1

Immediate delivery

Liberal dealer discount

No.	O.D. Exhaust	Retail
1	2⅛"	$1.90
2	2⅜"	1.90
3	2¾"	1.90
5	1⅞"	1.90
55	2"	1.90
5x	1¾"	1.90
6	1½"	1.90
66	1⅜"	1.90
7	2½"	1.90
8	3"	2.50
9	3⅛"	2.50
10	3¼"	2.50
11	3½"	2.75
115	3¾"	3.00
12	4"	3.00
123	4⅛"	3.00
125	4¼"	3.00
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LONGER LIFE

FOR BALL AND ROLLER BEARINGS

Your investment in anti-friction bearings is certainly great enough to warrant your investigating the possible savings to be made through the use of LUBRIPLATE lubricants. They actually preserve bearing surfaces, arrest progressive wear and protect against rust and corrosion. There are LUBRIPLATE lubricants for all speeds, all operating temperatures and conditions. Write for particulars.

Rx FOR YOUR MACHINERY

No. 2 — Ideal for general oil type lubrication, ring oiled bearings, wick feeds, sight feeds and bottle oilers.

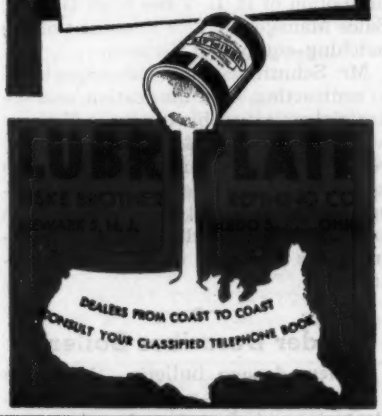
No. 8 — Because of high film strength and long life it reflects outstanding performance in most types of enclosed gears (speed reducers).

No. 107 — One of the most popular grease type products for general application by pressure gun or cups.

No. 70 — For a wide range of grease applications, especially at temperatures above 200 degrees F.

No. 130-AA — Known nationwide as the superior lubricant for open gears, heavy duty bearings, wire rope, etc.

BALL BEARING — This is the LUBRIPLATE Lubricant that has achieved wide acclaim for use in the general run of ball and roller bearings operating at speeds to 5000 RPM and temperatures up to 300 degrees F.



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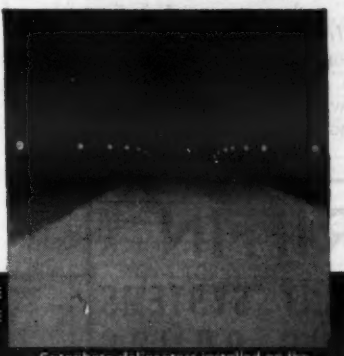

Cataphote delineators installed on the Pennsylvania Turnpike in 1940

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REFLECTORIZED SIGNS AND SIGNALS • GALVANIZED SIGN POSTS • PARKING SIGNS
STREET NAME SIGNS • DANGER SIGNALS • BUTTONS & CHAINS

Vitrified-clay skip-pipe requires no mortar joints, can be laid as fast as trenches are prepared. Here, workmen lay pipe for sub-surface drainage system at Grand Haven, Mich., airport.

Skip-Pipe Installed For Airport Drainage

Poor drainage, formerly a problem at the Grand Haven, Mich., airport, no longer troubles pilots who use the field. A new drainage system, recently completed, provides for interception and removal of surface and underground water from the field and adjacent areas.

There are now 5,430 feet of 6-inch pipe and 2,250 feet of 8-inch pipe underlying the field. Vitrified-clay skip-pipe made by The Robinson Clay Product Co., Akron, Ohio, was used for the underdrain system. Skip-pipe was specified because mortar joints are unnecessary and special lugs in the bell make correct alignment near-mechanical, it is said.

The average depth of trench was 5 feet, with all trenching handled by a Koehring No. 304 with a back-hoe attachment. A total of 550 cubic yards of porous backfill was used in covering the pipe. The drainage system and grading on the field cost $41,500 and were completed in 3½ months.

Appointments by Noble Co.

Noble Co., Oakland, Calif., manufacturer of batching and concrete-handling equipment, announces the appointment of William H. Schutte, formerly Vice President of Western Pipe & Steel Co., to the vice presidency of its newly created steel-forms division; and the promotion of H. L. Vines from General Sales Manager to Vice President of the batching-equipment division.

Mr. Schutte has had wide experience in contracting, steel fabrication, and industrial activities, having spent 15 years with Western Pipe & Steel Co., and 10 years with Blaw-Knox Co. Mr. Vines joined Noble Co. 4 years ago, after having served as a district representative for Caterpillar Tractor Co., and Western Sales Manager of R. G. LeTourneau, Inc.

Folder Describes Boilers

A new 4-page bulletin, "Meet the Titusville water-tube boilers, high-illustrations and engineering drawings of industrial and commercial boilers is available from The Titusville Iron Works Division, Struthers Wells Corp., Titusville, Pa.

Titusville water-tube boilers, high-pressure firebox boilers, heating boilers, Scotch marine power boilers, and Scotch marine heating boilers are illustrated in this folder. Information concerning the types available and their sizes is also given. The company's steam generators and 3 and 4-drum water-tube pressure boilers are drawn in detail.

The back page of the bulletin illustrates and describes available literature on specific types of Titusville boilers.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 57.

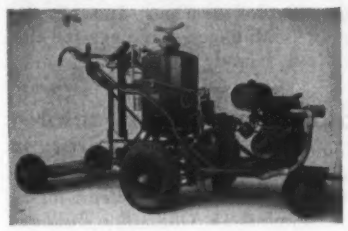
Steel Workbench

A new style of workbench is announced by Equipto, Division of Aurora Equipment Co., Aurora, Ill. It is said to be extra strong and made for heavy industrial and automotive uses, with a 12-gage-steel top. It is 6 feet long, 34 inches high, and 28 inches deep.

Advantages cited for it are that the steel will not gouge, splinter, warp, or crack. Because it is easy to keep clean and will not become oil-soaked, fire hazard is eliminated. Small lathes, drill presses, bench grinders, and punch presses can be attached and operated on the top of the bench. The bench may be bolted to the floor through concealed holes inside the flange of the end panel if desired.

The standard finish is of olive-green enamel, with any colors optional at slight extra cost.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 64.



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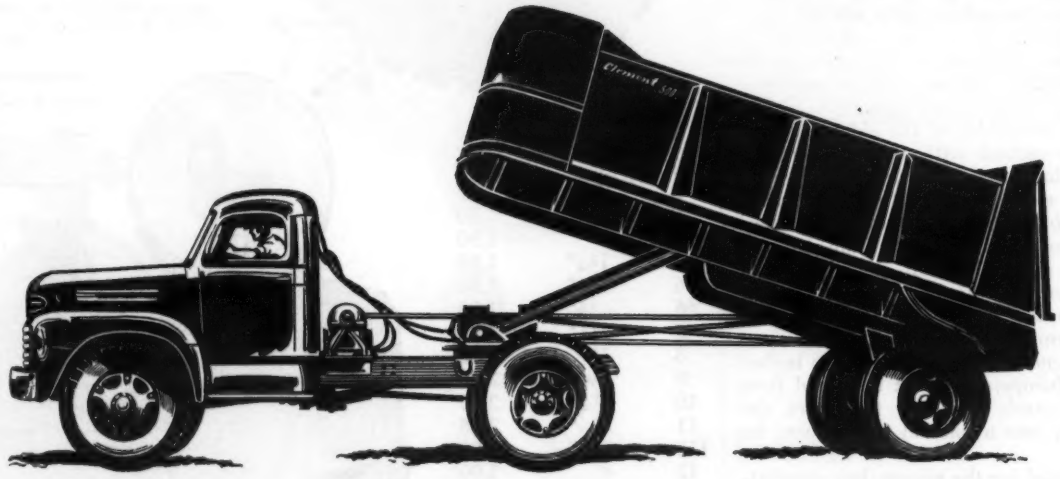
Self-propelled and completely self-contained, designed to meet the needs of state and county highway departments, municipalities and airports for accurate high speed striping.

Clean-cut, attractive lines are assured with K-C Air Curtains. Air actuated traction up to 5 MPH with a trailer for the operator. Truck mounted and other models available for all requirements. Write for folder.

KELLY-CRESWELL CO., Xenia, Ohio

Why your next dump trailer should be a

Clement "500"



Winch-Lift, Inc., the pioneer in the field of winch-operated dump trailers, now presents the *all* new Clement "500"!

The hundreds of users of winch-operated dump trailers and the thousands of interested visitors to our outstanding display at the 1948 A.R.B.A. Road Show in Chicago will find in the Clement "500" *proven design plus these new features!*

New swivel arm support eliminates twist—gives added flexibility.

New self-loading fifth wheel for easy assembly.

New lighter body design allows more payload than ever before, with a lower center of gravity.

New improved dumping efficiency with more perfect balance—less cable wear.

New rear sheave hanger assembly position raising cable lines for freer movement.

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Richard E. Johnson, recording-accelerometer technician, American Mutual Liability Insurance Co., demonstrates the control panel of the company's instrument which measures earth tremors resulting from blasts.

Instrument Measures Tremors From Blast

A new portable, specially designed recording accelerometer has been announced as its latest blasting safety equipment by the American Mutual Liability Insurance Co., 142 Berkeley St., Boston 16, Mass.

Set on the ground in the vicinity of structures to be protected, the accelerometer measures minute, vertical, horizontal, and transverse earth tremors resulting from the blast. The tremors, magnified 400 times, are recorded photographically on motion-picture film. They indicate the factor of safety present in the control of blasting.

On any specific job, through data obtained in a series of preliminary shots, a schedule of safe maximum charges is worked out. The amount of explosive set off at any one instant is then limited to the safe calculated amount. By means of delays, series of such small shots are set off at intervals and are used to comprise a round. Periodic check by engineers determines the continued safety of the blasting as the project progresses and eliminates possible danger to buildings.

Where the accelerometer test point is distant from the blaster, a Handie-Talkie radio is used for communication. This enables operation of the accelerometer to be synchronized with the actual firing of the round. Where a hill or other obstruction blocks the unbending 2-way radio sound waves, a field telephone line is run to afford direct communication.

The use of this type of recording accelerometer has been worked out over a period of years by Frank J. Crandall, Assistant Vice President and engineer of Liberty Mutual Insurance Co., also of Boston.

Further information may be secured from the American Mutual Liability Insurance Co. Or use the Request Card at page 16. Circle No. 1.

Truck Bodies Made In Several Models

Three models of truck bodies applicable to general service in the construction industry are manufactured by Tradewind Industries, Inc., Municipal Airport, Liberal, Kansas.

Platform beds 7 to 22 feet long, with a standard inside width of 88½ inches and 95 inches wide overall, are available with either steel or wood floors. The I-beam long sills and all-steel cross sills on all models prevent sagging floors, twisted frames, and broken underbodies. The wood flooring is a 2 x 4-inch tongue and groove secured by countersunk metal screws. The steel flooring is a 3/16-inch tread plate designed for heavy usage.

Low-side bodies for sand and gravel hauling are also made by the company. These bodies have the same floor dimensions as the platform bodies, with a standard side of 25½ inches. Additional heights may be obtained by special order. Also available are slatted-side stock racks for general package, barrel, and bag haulage. The sides on these models are 66 inches high. All wooden construction is of select heavy oak. Custom construction may be obtained by special order.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 40.

Informative Book Treats Hard-Surfacing Process

A thoroughly informative booklet titled "Hard-Surfacing With Hardex Arc-Welding Electrode" is available from the Metal & Thermit Corp., 120 Broadway, New York 5, N. Y. The 16-page folder has a number of features.

The first part explains the process of hard-surfacing and its applications. Following is a section on the four Hardex electrodes, their chemical composition, and the Brinell number obtainable with each. The effect of temperature, chemical composition, and rate of cooling on Hardex weld deposits is covered next in text and graphs. A discussion of how to select the right electrode and how to use it, plus some case histories, rounds out the report.

On the back cover is a useful table listing the approximate relations between Brinell, Rockwell, Shore, Vickers, and Firth hardnesses and the tensile strengths of SAE carbon and alloy constructional steels.

This literature may be obtained from the company or by using the Request Card at page 16. Circle No. 37.

Waterproof Sheeting

Bulletin No. 101 about Nervastral Seal-Pruf, a waterproof sheeting, can be secured from Rubber & Plastics Compound Co., Inc., 30 Rockefeller Plaza, New York 20, N.Y. The bulletin states that Nervastral Seal-Pruf is an unsupported homogeneous sheeting that is waterproof, storm-proof, and mildew-resistant.

The catalog lists the properties, characteristics, test results, and uses for the sheeting. The characteristics are discussed with relationship to pliability, tensile strength, aging, and the effects of heat, cold, salt water, and chemicals. The report illustrates the use of Seal-Pruf in building construction for weather protection; door and window flashing; waterproofing of foundations, side walls, and flooring; and as a moisture-vapor and termite barrier. Attached to the bulletin is a report on the results of tests made on Seal-Pruf by United States Testing Co., Inc.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 41.

Hollow Concrete Slab Construction Catalog

A new catalog on the precast precured hollow concrete slab unit named Flexicore is available from the company which developed it, Price Brothers Co., 1932 E. Monument Ave., Dayton 1, Ohio.

The 16-page folder explains how Flexicore is processed, reinforced, and erected, and gives its dimensions and weights. Included is a chart for computing design loads with a standard 6-foot x 12-inch section. The catalog lists 10 important advantages that the manufacturer claims for Flexicore construction. There is also a 2-page spread showing photographs of on-the-job construction applications. The last half of the bulletin is devoted to basic drawings for applying Flexicore to walls, roofs, floors, and special openings; plumbing and wiring details are included.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 45.

dart High Speed Concrete VIBRATORS

MINIMIZE BREAKDOWNS—*Avoid service problems with the new precision-built, high-frequency Dart Concrete Vibrator ... the one with the self-lubricating head.*

Dart is light weight. One man can operate. Choice of sizes in gasoline or electric models.

Dart offers:

- Faster concrete placement
- Freedom from breakdowns
- Long cable extensions
- Choice of head sizes
- Designed for low slump concrete

YOUR DART DEALER SELLS A VIBRATION SERVICE. SEE HIM OR WRITE FOR LITERATURE.

Mail coupon for literature and name of your nearest Dart dealer.

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1246 Champa Street
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Please send literature on the new Dart Vibrator line. I am interested in
( ) Electric Models ( ) Gasoline Models.
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Firm Name_____
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TRADING POST

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Make Winter pay extra profits. Electric and Diesel oil-burning engine heaters for cars, trucks, farm equipment, school buses, contractors' equipment. Makes cold weather starting easy. Distributors—dealers wanted.
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FOR SALE
3 YD.—MODEL 490
MARION ELECTRIC
a real bargain
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At least ten years' experience. Under 50 years old. In complete charge of project consisting of 2 miles of large sanitary sewer piping for established construction company in New Jersey. Capable of handling all types sanitary sewer projects. Familiar with estimating. Furnish experience record and complete data. Good salary.
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1201 Lima Shovel new. 1946 new Buda engine. 1948—3½-yd. Esco bucket, excellent condition.
2-ton Milwaukee hydraulic crane mounted on 1946 Chevrolet truck.
McCoy Sheepsfoot roller Reclamation specifications, 30,000 lbs. empty.
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McCoy rock dozer for D8 tractor.
Pioneer 4' x 10' scalping screen.
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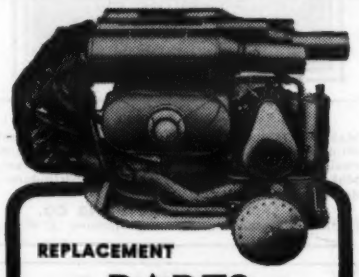

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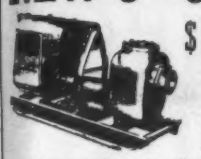

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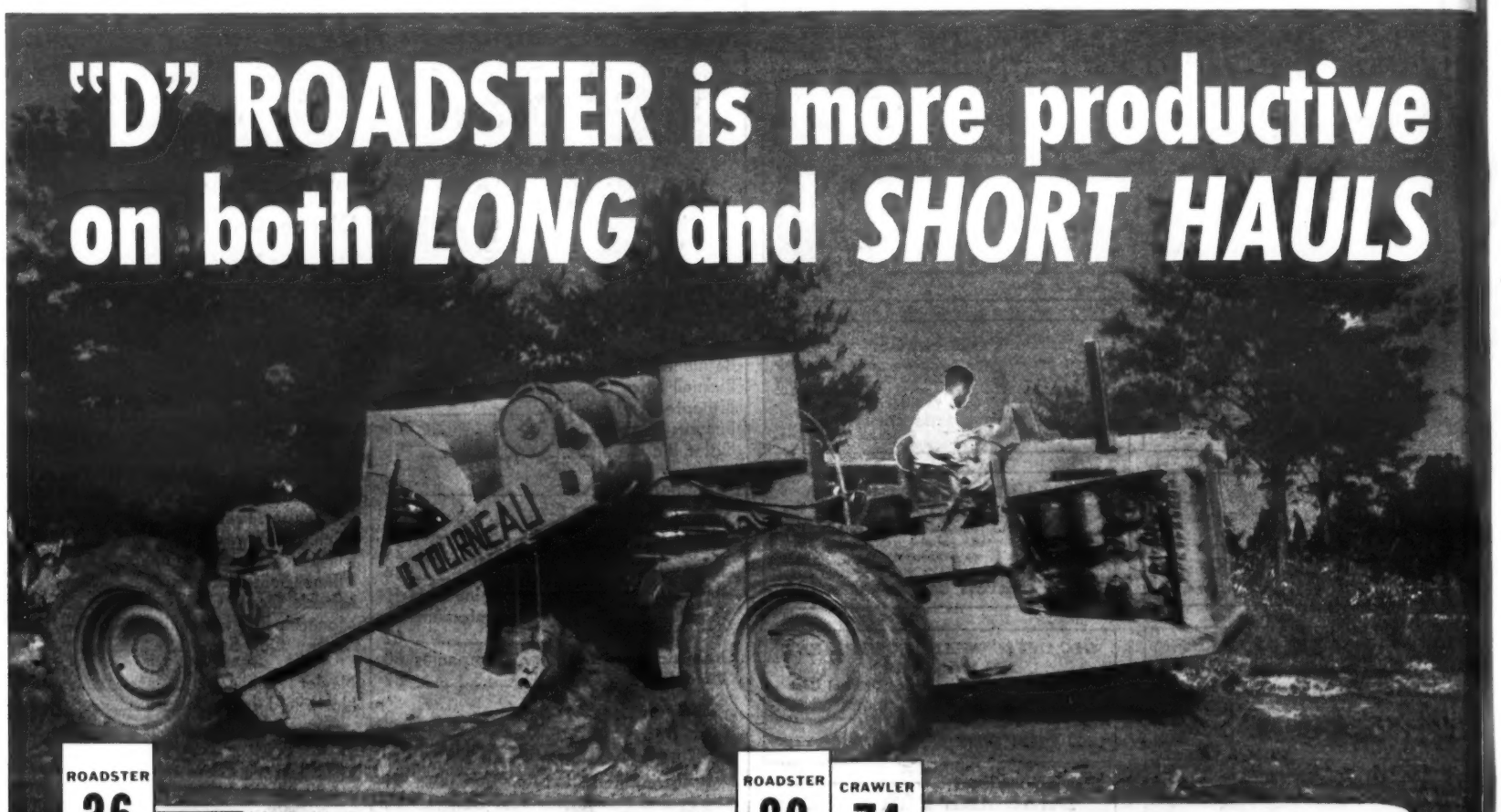

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... Doubled yardage output
OF 100 H.P. CRAWLER AND 8-YARD SCRAPER ON 2350' 1-WAY HAUL

On cut and fill work for secondary road near Tuscumbia, Ala., a rubber-tired, 25 m.p.h. D Roadster proved itself *more* than a high-speed maintenance tool. The 100 h.p., 7-yard rig produced *twice* the yardage of a 100 h.p. crawler and 8-yard scraper, working on same 2350' one-way haul. Check the record yourself:

The crawler unit loaded 5½ pay yards of common earth in 39 seconds . . . made round trip every 15.1 minutes Roadster took 1.23 minutes to self-load 4½ pay yards, but "D's" faster haul speed cut cycle time to 6.3 minutes . . . averaged 8 trips per hour to crawler's 3.3. That's 18.15 pay yards hourly with crawler . . . *36 pay yards for higher-speed "D".*

ROADSTER **80** YARDS | CRAWLER **74** YARDS
PAY YARDS PER HOUR

... Moved 9 per cent more
THAN 93 H.P. CRAWLER AND 10-YARD SCRAPER ON 425' 1-WAY HAUL

On another Alabama county road job, near Heflin, a high-speed D Roadster out-performed a 93 h.p. crawler and 10-yd. scraper . . . this time, on a short haul of 425' one way . . . and in tough, rocky clay. Material had 25% voids and was ripped before loading. The bigger-capacity crawler combination loaded 6½ pay yards . . . averaged 11.4 loads . . . 74.1 pay yards per hour. The smaller, but faster, electric-control "D" self-loaded 4 pay yards . . . made 20 trips to the crawler's 11.4 . . . averaged 80 pay yards an hour, an increase of 9%.

Check D Roadster's production ability on your long and short haul dirtmoving. See your LeTourneau Distributor TODAY for complete facts.

R144-a

LETOURNEAU PEORIA, ILLINOIS — JOB-PROVED Over 6200 Built and Shipped — **TOURNAPULLS**

MORE WORK PER HOUR WITH RUBBER-TIRED POWER